Northern California's Computer Magazine
July 25, 1994 • #125
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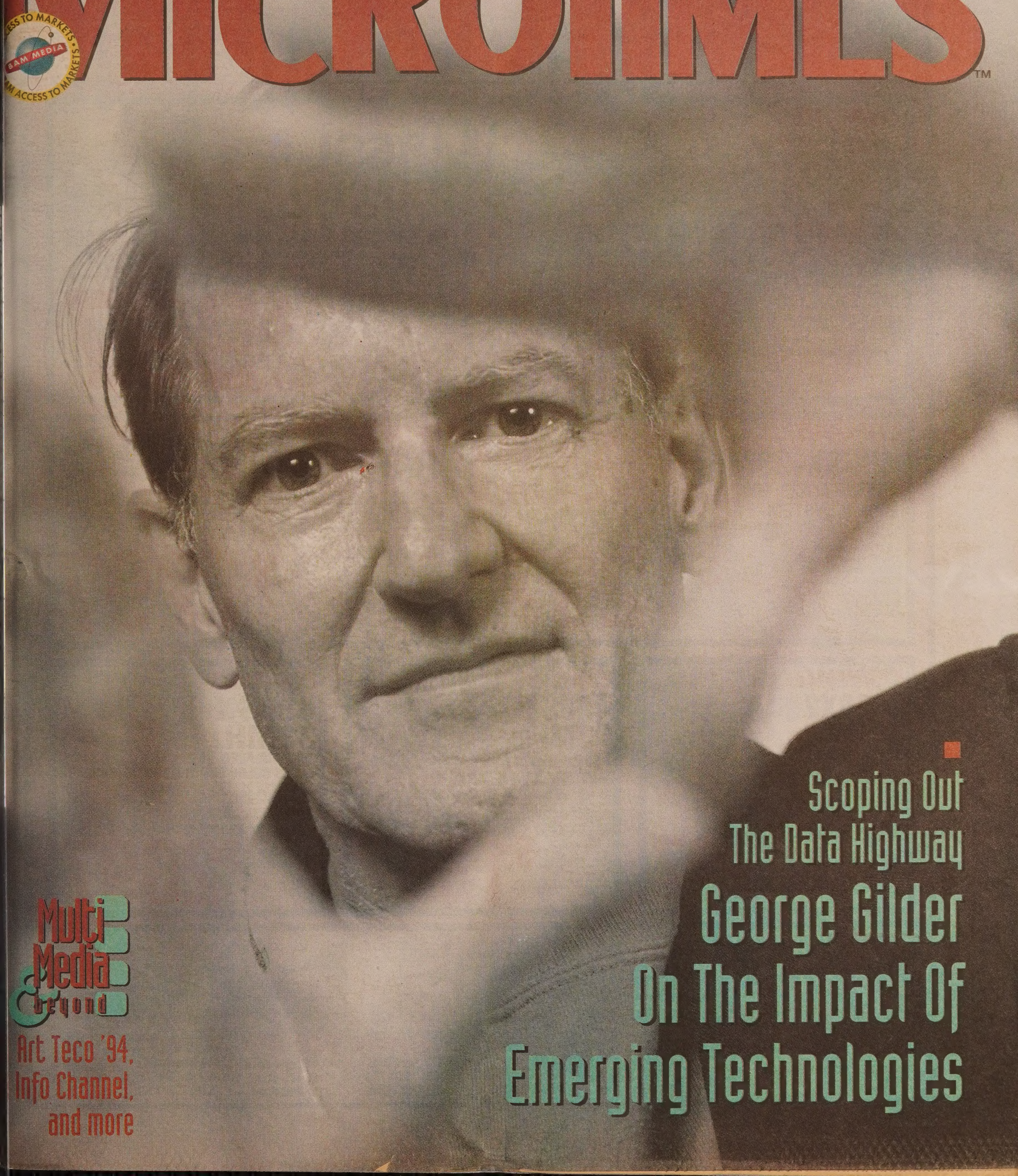

Scoping Out The Data Highway

George Gilder On The Impact Of Emerging Technologies

Multi Media & beyond

Art Teco '94, Info Channel, and more

COMPAQ DESKTOP COMPUTER OR NOTEBOOK FOR UNDER $1000! DON'T MISS THIS HISTORIC EVENT!

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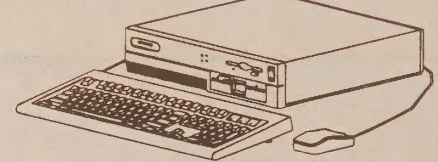

486SX 33MHz

PRESARIO 633 200MB SYSTEM

486SX-33MHz CPU • 200MB Hard Drive • 4MB RAM expandable to 32MB
Dual Floppy Drive • Local BUS SVGA • 3 ISA expansion slots • 3 drive bays
Internal fax/modem • Mouse
Preinstalled software:
MS DOS • MS Windows 3.1
PFS: WindowWorks 2.0
Delrina WinFax Lite • Prodigy
America On-Line
Symantec Games Pack
Monitor Not Included
#1866913

$997

COMPAQ

486SL 25MHz

CONTURA AERO 4/25 84MB SUPER LIGHT NOTEBOOK

486SL 25MHz CPU • 84MB Hard Drive • 4MB RAM Expandable To 12MB
Model Does Not Include An Integrated 3.5" 1.44 MB Disk Drive • EasyPoint Trackball
76-Key Keyboard • Integrated speaker • MS-DOS 6 • Microsoft Windows • WinLink Transfer
Utility With Cable • Lotus Organizer
TabWorks • Online Documentation
3 Year Limited Warranty
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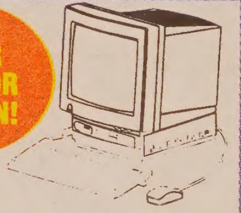

486SX-33MHz

PRESARIO 433-200 200MB SYSTEM

14" COLOR MONITOR BUILT-IN!

Intel 486SX-33MHz CPU • 200MB Hard Drive
4MB RAM expandable to 20MB
3.5" 1.44 Floppy Drive
Two ISA expansion slots
Voice Mail Fax/Modem • Mouse
Built-in SVGA Display
MS DOS • MS Windows
MS Works
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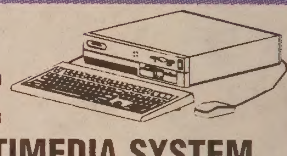

486SX-33MHz

PRESARIO 633 CDS 200MB MULTIMEDIA SYSTEM

486SX-33MHz CPU • 200MB Hard Drive • 4MB RAM expandable to 32MB
3.5" 1.44MB Floppy Drive • CD-ROM drive (dual-Speed) • SoundBlaster 16 Audio Board
External speakers and microphone • Local BUS VGA • 2 ISA expansion slots • 3 drive bays Internal fax/modem • Mouse
Preinstalled software:
MS DOS • MS Windows 3.1
TabWorks • Microsoft Works
CD-ROM titles
Prodigy • America On-Line
Microsoft Entertainment Pack
Symantec Games Pack
Delrina WinFax Lite
Monitor Not Included
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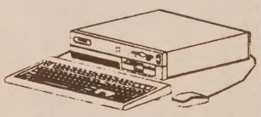

486SX2 66MHz

PRESARIO 660 340MB SYSTEM

486SX2-66MHz CPU • 340MB Hard Drive
4MB RAM expandable to 32MB • Dual Floppy Drive
Local BUS SVGA • 3 ISA expansion slots • 3 drive bays
Internal fax/modem • **Preinstalled software:** MS DOS
MS Windows 3.1 8 PFS: WindowWorks 2.0 • TabWorks
Delrina WinFax Lite • Prodigy • America On-Line
MS Entertainment Pack
Monitor Not Included
#1910290

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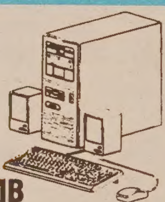

486SX 33MHz

PRESARIO 833 CDS 270MB MULTIMEDIA SYSTEM

486SX-33MHz CPU • 270MB Hard Drive • 4MB RAM expandable to 56MB
Dual Floppy Drive CD ROM drive (Dual-Speed) • SoundBlaster 16 Audio Board
Mouse • External speakers and microphone Local BUS VGA • 4 ISA expansion slots • 5 drive bays Internal Fax/Modem • Supports Intel OverDrive processor (486DX2/66), as well as future OverDrive processor with Pentium technology
Preinstalled software: MS DOS • TabWorks • MS Windows 3.1• Microsoft Works
Delrina WinFax Lite
Prodigy
America On-Line
Microsoft
Entertainment Pack
Symantec Games Pack
CD ROM Titles
Quicken for Windows 2.0
Monitor Not Included
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COMPAQ

486SX 33MHz

CONTURA AERO 4/33C-170 170MB COLOR SUPER LIGHT NOTEBOOK

486SX-33MHz CPU • 170MB Hard Drive
4MB RAM Expandable To 12MB • Passive Color
Model Does Not Include An Integrated • 3.5" 1.44 MB Disk Drive
EasyPoint Trackball • 76-Key Keyboard • Integrated Speaker
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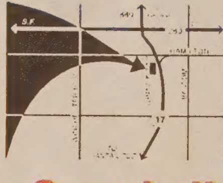

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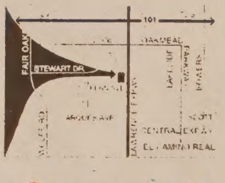

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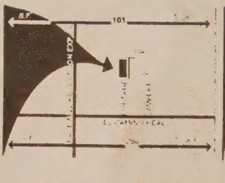

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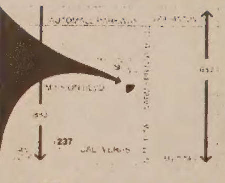

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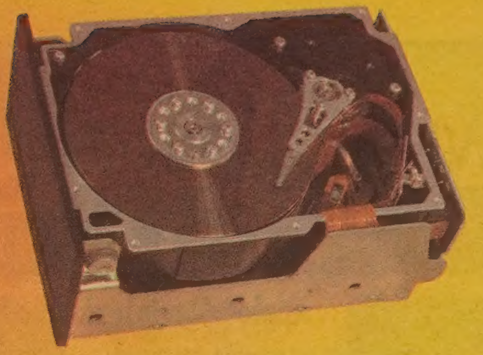

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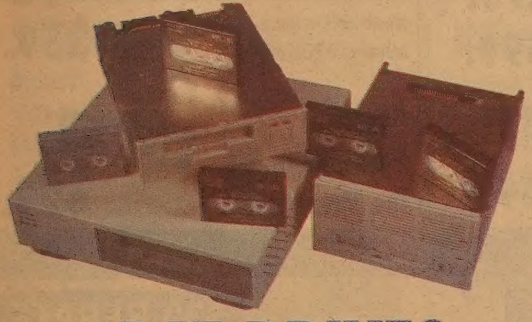

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Store over 4GB of data on a single DAT Tape! DAT Cartridges are the size of a matchbook, and with common data compression software, can hold 4000MB of your data for safekeeping.

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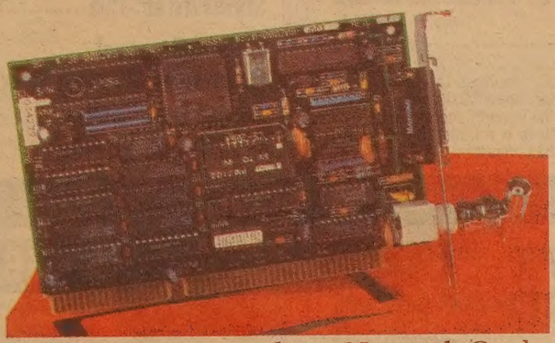

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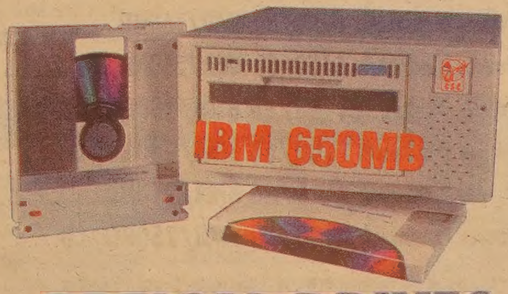

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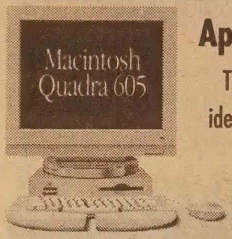

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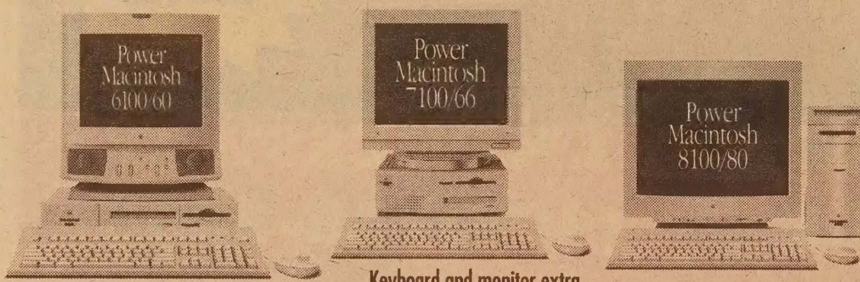

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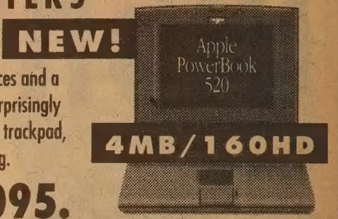

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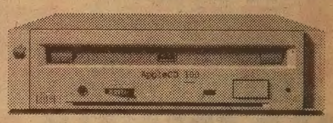

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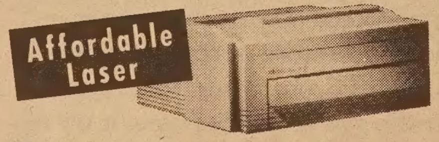

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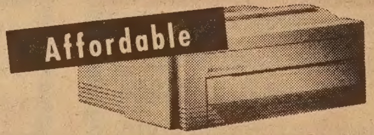

HP LaserJet 4 ML Printer

This postscript laser printer for the Macintosh comes standard with 4MB of memory and a lightening fast processor. Features auto-switching between Adobe® Postscript® Level 2 and enhanced HP PCL5 and 80 scalable typefaces, built-in Postscript, 35 Intellifont, 10 True Type (Windows).

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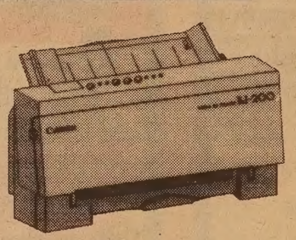

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color

BJC-600 Personal Color Printer

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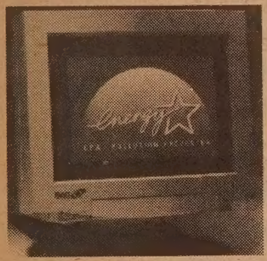

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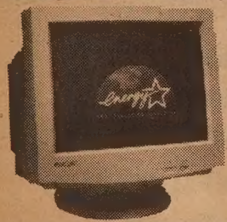

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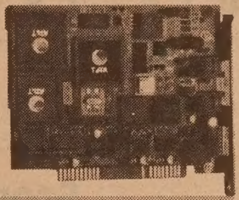

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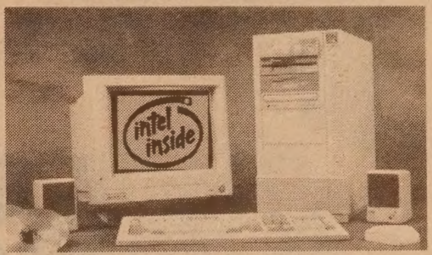

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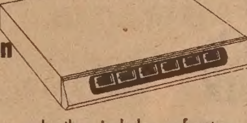

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The Standard for Macintosh Joysticks
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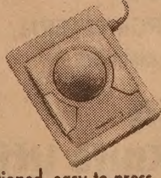

Turbo Mouse 4.0
Includes a new software package that lets you customize cursor control. Features comfortably positioned, easy-to-press buttons and two ADB ports. It's System 7.0 compatible and comes with a limited lifetime warranty. **$114⁹⁵**

MULTIMEDIA

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AMERICAN

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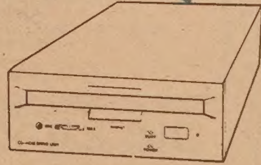

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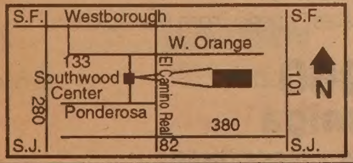

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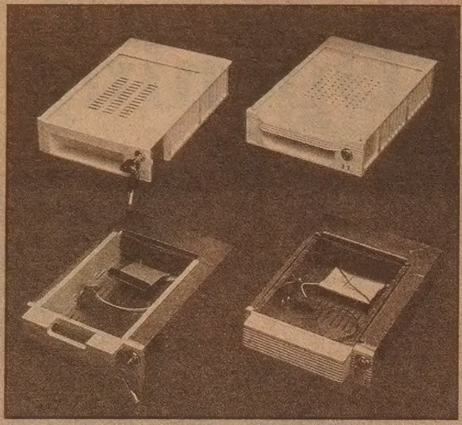

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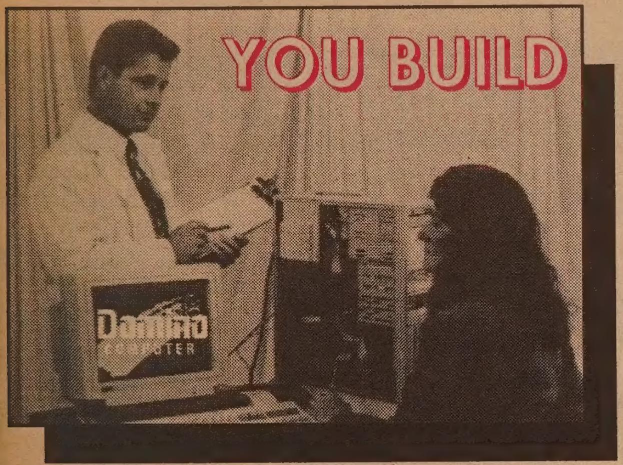

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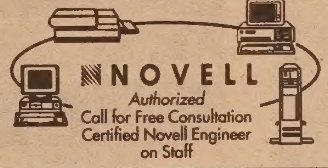

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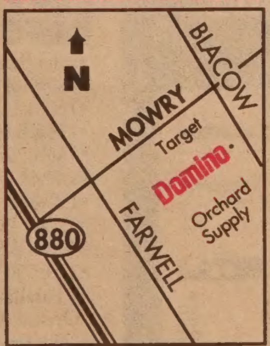

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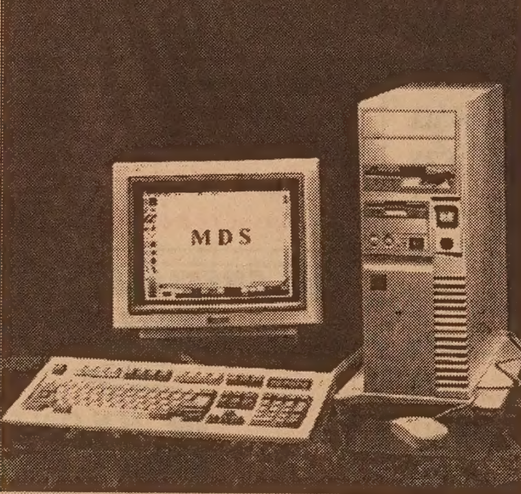

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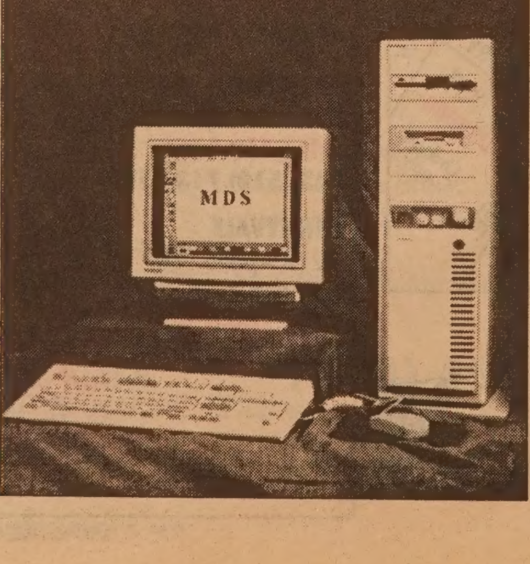

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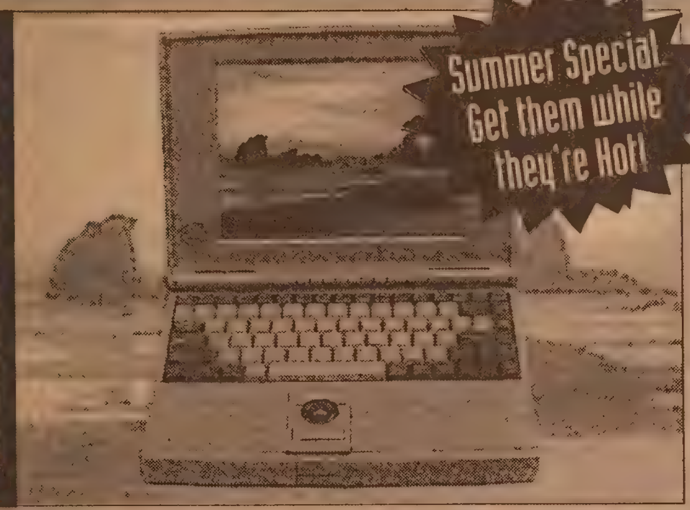

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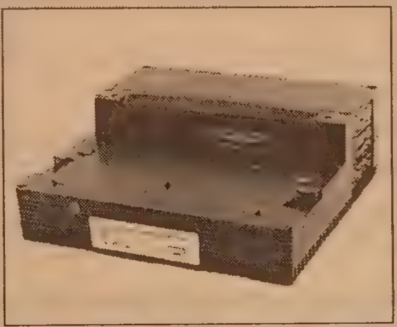

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This Vol. 10 No. 9 July 25, 1994, Whole No. 125. MicroTimes, California's Computer Magazine, is published by BAM Media, Inc., 3470 Buskirk Ave., Pleasant Hill, CA 94523. Phone Advertising Office (510) 934-3700. Fax (510)934-7351. email Microx@well.sf.ca.us Los Angeles Office, 6767 Forest Lawn Drive, Suite 110, Los Angeles, CA 90068. Phone (213) 851-8600. Fax (213)851-8303. San Jose Office, 36 Harold Ave., Suite 2, San Jose, CA 95117. Phone (408) 244-4400. Fax (408) 248-4552. Anaheim Office, 801 East Katella Ave., Suite #210, Anaheim, CA 92805. Phone (714) 939-2809. (714)978-6135. MicroTimes™ is © 1994 by BAM Media, Inc. Subscription rates: 14 issues, U.S.: 4th Class $35 (Allow 3 to 4 weeks for delivery), 1st Class $65 (Allow 1 to 2 weeks for delivery). MEXICO & CANADA: Surface Mail $50 (Allow 4 weeks for delivery). Air Mail $75 (Allow 1 week for delivery). OVERSEAS: Surface Mail $50 (Allow 6-10 weeks for delivery), Air Mail $178 (Allow 1 week for delivery). To receive sample issues, please send $5 ($6 for overseas) to cover postage costs. Back issues are $6 each. All rights reserved. Reproduction in whole or in part without permission of Publisher is strictly prohibited. The staff and management of MicroTimes do not advocate or encourage the use of any product or service advertised herein for illegal purposes.

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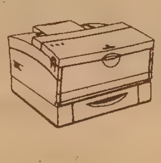

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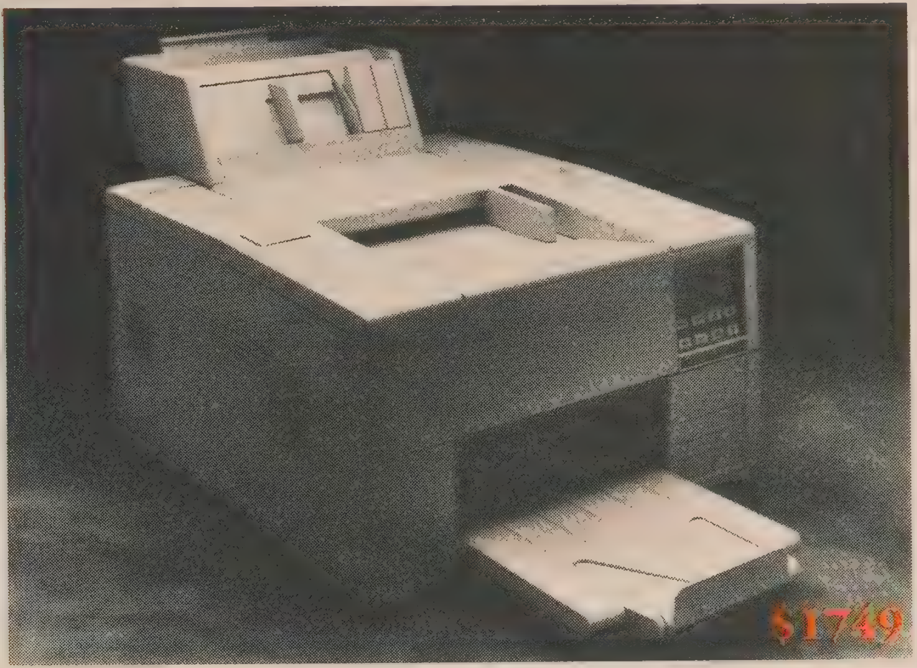

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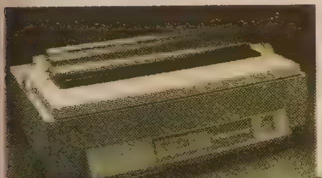

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Social Commentary

Kudos on your articles covering real topics related to computers, tech, and society. Another product review would make me choke sometimes.

I am speaking of the Barlow summary/thought piece on "To Be at Liberty" [issue 124N/125S] and Jim Warren's piece on reversing the consumer-driven economy [issue 124]. I am glad to see someone who agrees with me that a command and control solution will never succeed until we move to an attitude of "global well-being for ourselves and our children...[while we] avoid the functional dictatorship of oppressive bureaucracy and pervasive governmental bureaucracy."

Bravo. Now turn off the TV, Jim, and get on with reality.

David Zetland
Palo Alto

For another point of view on this, see the following letter...

I totally disagree with Jim Warren's statement "No matter how hard we try, we no longer consume as much as we can produce." If anything, the truth is "we" never have been able to produce as much as "we" "can" consume.

If the entire profession of economics is founded on one principle, it is precisely the fact that there is never enough production (supply) to match the consumption (demand) of the public at large.

Charles Rakowski
Fountain Valley

Correction

There was a mistake in Lenny Bailes's article on Multimedia in the May 2 issue. Lenny referred to Future Domain's PowerSCSI! software as SCSI Value Pack. SCSI VALUEPAK actually refers to a kit that includes the SCSI controller, PowerSCSI! software, utility software, a cable, and documentation. PowerSCSI! is a universal application interface that allows a single SCSI controller to work with anyone's peripherals, regardless of the interface language used for writing the peripheral drivers.

David Kaye, KPR

We regret the error, and cordially invite our readers to call Future Domain at (714)253-0400 for more info.—eds

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News and Views

BY PAUL HOFFMAN

Industry Insight

Microsoft And Stac Settle Suit, Cross-License Patents

In a decision that will benefit both PC users and both companies, Microsoft and Stac have agreed to cross-license their patents to each other. At the same time, Microsoft will pay Stac over $100 million over time. The result of the settlement won't change the MS-DOS market much: almost all new PCs will still come out with MS-DOS 6.22 with Microsoft's DriveSpace technology (as compared to v6.0 and 6.2 which came with DoubleSpace).

Because of the settlement, future version of MS-DOS and Stac's Stacker programs will also probably have software that allows them to convert drives that have been compressed with either DriveSpace, DoubleSpace, or Stacker. The patent cross-licensing is for all current patents as well as for compression patents issued in the next five years, giving Stac plenty of time to come up with other products. Stac is now in a much better position to offer its technology to other operating system companies, like IBM and Novell.

The Intel-HP Alliance: This Is Not Your Father's CPU

The struggle for the PC desktop in 1999 has already begun among the CPU manufacturers; the only thing that's clear is that the winner will be able to run Microsoft Windows v6, whatever that will be. All chip makers are trying to determine the best strategy for the next five years, one that incorporates the ability to run today's programs as well as tomorrow's advanced operating systems, all at high speeds. Although it will remain hard to predict the winners in the next few years, today's PC users are already starting to see how the various companies will position themselves.

The first major move towards the future came earlier this year with the release of the PowerPC systems from Apple and IBM. PowerPC will likely become the most popular RISC (reduced instruction set CPU) chip used in desktop PCs within a year, displacing the SPARC chip made popular by Sun Microsystems. IBM and Motorola are keeping the prices on PowerPC chips very low, and they are working hard to make people think of the PowerPC as a serious competitor to Intel's Pentium.

The recently announced agreement between Intel and Hewlett-Packard is the second major move. The partnership will create the next-generation CPU that will run today's software and will, presumably, run future software that's optimized for the chip at very high speeds. This family of chips will be manufactured by both companies starting in approximately 1998. The companies said almost nothing about the technologies that will go into the chips, but they are likely to be based on the vast experience of both Intel and HP. Intel's previous forays into the RISC field have been resounding failures.

At first, the Intel-HP alliance may seem strange, since HP's current RISC offering, the PA-RISC series, is not all that successful in the market. Although PA chips are good performers, they haven't been widely adopted, and few believe there's much that can be done in the next few years to make them much faster than their competitors.

On the other hand, HP has discussed dropping RISC over time in favor of a new concept, the very long instruction word (VLIW) CPU. HP would presumably make a VLIW CPU that ran PA-RISC software at fairly reasonable speeds, much like Apple runs 68000-based Macintosh software on the PowerPC.

By becoming partners with HP instead of a RISC manufacturer, Intel is likely to create its next generation of CPUs (after the P6, due in 1996) as VLIW chips using HP's VLIW technology. This is clearly a big risk for Intel; it also has possible huge rewards. So little real-world experimentation has been done with VLIW chips that it is impossible to say how well they will do running desktop PC software, or even how well they will do emulating the x86 software that is run today.

> **BY BECOMING PARTNERS WITH HP INSTEAD OF A RISC MANUFACTURER,**
>
> INTEL IS LIKELY TO CREATE ITS NEXT GENERATION OF CPUS (AFTER THE P6, DUE IN 1996) AS VLIW CHIPS USING HP'S VLIW TECHNOLOGY.
>
> **THIS IS CLEARLY A BIG RISK FOR INTEL; IT ALSO HAS POSSIBLE HUGE REWARDS.**

VLIW chips are significantly different from RISC chips in many ways. The basic feature that sets RISC chips apart from currently popular CPUs is that they have a small number of equally sized instructions. This makes it much easier for the CPU to process its instructions and allows the CPU to execute many instructions at once. VLIW processors, on the other hand, expect many instructions that can be run in parallel to already be bunched together; the chips are optimized for this kind of operation. However, for VLIW to get much speed improvement, the instructions must

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be bunched correctly.

This bunching brings up the risks that HP and (presumably) Intel face: they must get good compilers for whatever chip they make. Of course, good compilers are needed for RISC chips, but RISC chips still run fairly quickly even with unoptimized instructions. In fact, Intel's Pentium continues to suffer from lower-than-expected speed ratings because not enough programs have been recompiled to take advantage of some of its features. VLIW is particularly compiler-sensitive; if the instructions aren't bunched well, the CPU is doing much less than it might. Today's PC software vendors buy their compilers from at least five different major compiler companies, so the Intel-HP alliance will have to work hard to make sure that there are many good compilers before their new CPU comes out.

An even larger risk, however, is that the VLIW technology that they choose doesn't match well with the way PC users work. Today, most people use graphical interfaces like Windows and the Macintosh; no one knows whether interactive graphical interfaces will run as quickly on VLIW chips as they do on today's RISC chips. By 1999, the entire networking market will have changed; again, it is unclear if the kind of networking that people are doing then will work better with VLIW or with RISC. On the other hand, if VLIW turns out to be a winner in these areas, Intel and HP may be the only players for many years until their competitors catch up.

Even if Intel doesn't choose VLIW, it must decide soon what its next step will be. Of course, whatever type of CPU Intel decides to build will run today's x86 software. However, it is not clear how. The new generation of hardware may be a dual-CPU that runs its own software in one part of the CPU and the x86 software in another. Intel may choose the route of the PowerPC and simply emulate x86 software in the new CPU, although this is unlikely. Another possibility is that the new CPU won't run x86 software at all, but the chips will be designed to run in parallel with a very cheap x86 CPU when needed.

Given how far off this next generation is, Intel should be at least a bit worried about what might happen between now and then. IBM is widely rumored to be making a PowerPC chip that will run x86 software on the CPU. Given IBM's licenses and its massive base of technology, this should not be all that difficult, although getting it perfect will take some time. At the same time, Apple is rumored to have a much, much faster x86 emulation package for its PowerPC Macintoshes that could be available by the end of this year (Apple's current product is incredibly slow and requires a huge amount of RAM). If these are in place and popular by the end of 1995, Intel will feel even more pressure to get its next major step right.

Clearly, the biggest part of any decision by Intel will be how to keep today's users the happiest over the next decade. Pentium prices are coming down, and the next generation (possibly the last generation) of the x86 chip, the P6, will be in place within two years. However, beyond that, Intel has no clear strategy. If its alliance with HP turns out a new type of CPU, the Intel marketing machine will certainly make sure the new CPU gets much more than its fair share of attention. If the CPU is even a moderate technical success, Intel will have it made for another ten years. If the new CPU is a dud, the PC market in 1999 could be very different than it is today.

Away From The Office: New Networking Strategies Emerging

Now that the portable computer is ubiquitous, many businesspeople feel freer to work at home or on the road. Telecommuting from home has become common in many industries, and corporate MIS departments have become very familiar with linking remote workers to the company network through banks of modems. Networking software for modem users has been optimized to take into account the relatively slow speed of modems.

Businesspeople on the road have a different set of worries that are just now being addressed. Unless you're sure that you will be at a phone from which you can dial to the corporate network, a modem and network software won't do you much good. Instead, many people are looking to wireless communications such as cellular modems. These solutions pretty much replicate the normal modem but do not require you to find a phone jack that you can use. Cellular companies are especially happy with these solutions because they increase the amount of high-priced phone traffic they carry.

Many business travelers do not need to be hooked into the corporate network, or only need to do so for a few minutes a day to exchange email. For these people, wireless technology is much too expensive and cumbersome. Instead, they are turning to new products that give them more flexibility but cost much less.

A recent example of such technology is the Pereos storage system from start-up manufacturer Datasonix in Boulder, Colorado. For $600, you get a player about the size of a Walkman that contains a 1GB tape cartridge. You can plug the player into any PC and use it as an adjunct to your current portable or desktop system. Additional cartridges, which are the size of a large postage stamp, are $30 for 1GB or $50 for 2 GB. Pereos should be available within the next few months.

If most of your access to the corporate network is for files, being able to load a gigabyte in your pocket could eliminate most of your network needs, aside from things that change day to day such as email. Before you go on the road, you load everything you might need onto the cartridge; with a gigabyte to spare, that "everything" can indeed be everything. Using software that comes with the system, you then access the files you need as you need them. When you dial in to get your email, you can update the files you need as well.

New software that aids business travelers is also becoming popular. Many packages help you keep the files on your desktop at the office the same as your portable, and others will even dial your modem after 11 pm and do the file exchange when the phone rates are low and the system network is probably less busy. This kind of software is not as vital for people who dial into the network all the time, but is a great boon for those who can't, or simply choose not to. ■

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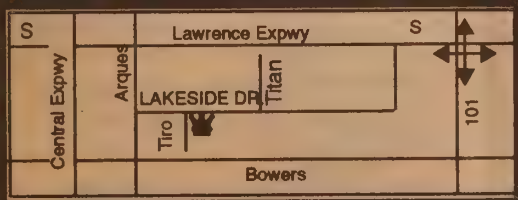

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NYS	Tandy	TAN	37.63	33.75	-3.88	-10.30	14	0.60	1.78	50.75	28.13
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OTC	Intel	INTC	61.38	58.38	-3.00	-4.89	11	0.24	0.41	74.50	49.25
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Note: Compaq completed a 3-for-1 stock split. Commodore has been delisted and removed from our list.

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER

(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES....................	3
DECLINES.....................	28
UNCHANGED................	0
NEW HIGHS..................	3
NEW LOWS..................	4

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER....................	Oracle..................................	$	2.50
LARGEST DOLLAR LOSER......................	Lotus....................................	$	-27.13
LARGEST PERCENTAGE GAINER...........	Oracle..................................		7.33 %
LARGEST PERCENTAGE LOSER............	Lotus....................................		-44.20 %

	CLOSE 05/27/94	CLOSE 06/24/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	4709.29	4238.94	-470.34	-9.99
DOW JONES INDUSTRIAL AVERAGE	3757.14	3636.94	-120.20	-3.20
STANDARD & POOR'S 500 INDEX	457.33	442.80	-14.53	-3.18
N.Y.S.E. COMPOSITE	252.79	244.55	-8.24	-3.26
NASDAQ COMPOSITE	733.14	693.79	-39.35	-5.37

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
12/17/93	4644.25	3751.57
01/07/94	4866.50	3820.77
02/04/94	4728.74	3871.42
03/04/94	5081.75	3832.30
04/05/94	4878.26	3675.41
04/29/94	4639.86	3668.31
05/27/94	4709.29	3757.14
06/24/94	4238.94	3636.94

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Fear and loathing on Wall Street made their presence felt in the high-tech sector when interest rates soared and the dollar plunged during the monthly trading period ending June 24.

Computer stocks, however, were singled out for especial punishment last month above and beyond Wall Street's own problems. The reason: investors feared a seasonal summer slowdown would take its toll on computer companies' profits in the next two quarters. That specter triggered numerous ratings downgrades from Wall Street brokerage firms.

The result: the MicroTimes Stock Index, which monitors the stocks in the accompanying table each month in this magazine, sank like a stone. The box score for our index of 31 stocks: down a resounding 470.34 points, or 9.99%, before pausing to catch its breath at 4238.94. In fact, the MicroTimes Stock Index fared the worst of all the indicators in our market diary section en route to its lowest mark in 1994. One look at the advance/decline comparison for high-tech stocks tells how far and wide the sell-off was in our sector last month, as twenty-eight stocks fell in price vis-a-vis three that rose.

Lotus plunged $27.13 a share, or 44.2%, en route to a close of $34.25. The Cambridge, MA-based company's market value collapsed after it warned that second-quarter earnings would be roughly half of what Wall Street anticipated. The reaction was swift and direct, as shareholders cut the company's stock price nearly in half as a result.

Apple turned sour to the tune of 14.5% to close at $25.61. Last month, the company withdrew from a technology conference, which heightened concern about Apple's third-quarter earnings. Officials at Bear, Stearns & Co., host of the technology conference, said Apple also withdrew from the firm's technology conference in 1993, and soon after reported an unexpected loss of $1.63 a share for the fiscal third quarter ended June 30, down from earnings of $1.07 a year earlier.

Digital Equipment fell 13.1% last month en route to a close of $19.88. The company, whose stock has fallen nearly 40% in 1994 alone, froze wages and salaries across the board last month. DEC has also said it will take another restructuring charge, which some analysts are projecting to be as high as $1 billion. Several companies, including Moody's, are reviewing DEC's debt securities for possible downgrade.

Oracle Systems bucked the downtrend on Wall Street and in the technology sector and rallied $2.50 a share, or 7.3%, to $36.63. Numerous Wall Street analysts sang their praises for the Redwood City, CA-based company and its earnings prospects in the coming quarters. Oracle, not surprisingly, was the largest dollar and percentage gainer of the lot last month. ■

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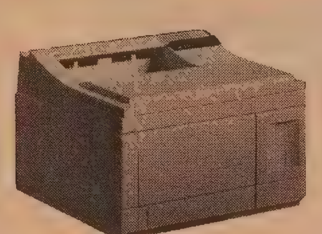

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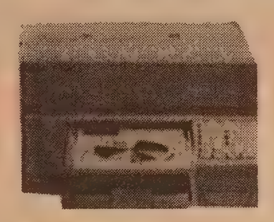

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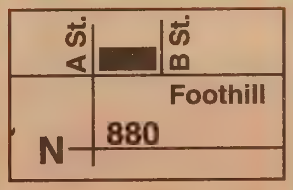

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- Premium Digital Full Tower 250W PS
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Dare to Compare

WinStone 94.......... 105.1

Test result based on our 90MHz system with ATI Turbo Pro PCI 2MB Video card. Viper Pro not yet available at testing time. See your PC Magazine for comparsion.

UMiracle P5 PCI 60/66MHz

- UMiracle P5 PCI 256K L2 Cache Motherboard with 4 PCI's/4 ISA slots, Onbrd PCI NCR Fast SCSI-2
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- Diamond Stealth 64PCI 2MB VRAM (upto 4MB)
- Mag DX17F 17" 1280x1024NI 0.26DP Digital Green Monitor
- Premium Digital Medium Tower 230W PS
- 101 Keytronic Keyboard

60MHz $3218

UMiracle 66MHz $3602

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	77.01
- Video	1524.52
- Disk	1813
DOSMark	870.66
Graphics WinMark	19.00
Disk WinMark	1490

Test result based on our 66MHz system with Diamond Viper PCI 2MB Video card. Stealth 64 not yet available at testing time. See your PC Magazine for comparsion.

UMiracle 486 LM PCI

UMiracle

- UMiracle 486 PCI 256K L2 Cache Motherboard with 3 PCI's/4 ISA slots, Onbrd PCI NCR Fast SCSI-2
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33SXIntel-$1926
33DXIntel-$2064
40DXAMD-$1995
50DX2AMD-$2028
66DX2AMD-$2076
66DX2Intel-$2088

READY TO GO

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	45.75
- Video	1528.63
- Disk	1110.00
DOSMark	600.31
Graphics WinMark	15.4
Disk WinMark	1030

Test result based on our 66MHz system with Diamond Viper PCI 2MB Video card. Stealth 64 not yet available at testing time. See your PC Magazine for comparsion.

AIR 486 EISA VLB - EI-Line

READY TO GO

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- 16MB 70ns 72Pin SIMM RAM (16MB x 1pc)
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33SXIntel-$3103
33DXIntel-$3241
40DXAMD-$3172
50DX2AMD-$3205
66DX2AMD-$3253
66DX2Intel-$3265

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	46.51
- Video	1351.86
- Disk	1524
DOSMark	623.14
Graphics WinMark	15.8
Disk WinMark	1240

Test result based on our 66MHz system with Diamond Viper VLB 2MB Video card. Stealth 64 not yet available at testing time. See your PC Magazine for comparsion.

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AIR 486 ISA VLB - MIS-Line

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- Premium Digital Medium Tower 230W PS
- Honeywell 101 Enhanced Keyboard

33SXIntel-$1551
33DXIntel-$1689
40DXAMD-$1520
50DX2AMD-$1653
66DX2AMD-$1701
66DX2Intel-$1713

AiR
Advanced Integration Research, Inc

Dare to Compare
[illegible]
- Processor............ 45.37
- Video.................. 3665.02
- Disk.................... 1191
DOSMark.............. 698.17
Graphics WinMark.. 8.55
Disk WinMark......... 1040

Test result based on our 66MHz system.
See your PC Magazine for comparsion.

AIR 486 ISA VLB - SH-Line

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- S3-805 VLB 1MB Windows Accelerator
- KFC 14" 1024X768NI 0.28DP Monitor
- Premium Digital Mini Tower 230W
- Honeywell 101 Enhanced Keyboard

33SXIntel-$1171
33DXIntel-$1309
40DXAMD-$1140
50DX2AMD-$1273
66DX2AMD-$1321
66DX2Intel-$1333

AiR
Advanced Integration Research, Inc

Dare to Compare
[illegible]
- Processor............ 39.85
- Video.................. 3663.29
- Disk.................... 1044.03
DOSMark.............. 633.09
Graphics WinMark.. 8.51
Disk WinMark......... 844

Test result based on our 66MHz system.
See your PC Magazine for comparsion.

UMiracle 486 Green ISA VLB

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- 486 Green ISA VLB 256K Cache Motherboard
- 4MB 70ns SIMM RAM (1MB-30Pinx4)
- Fast 32Bit VLB IDE Controller with 2S/1P/1G
- 1.2M & 1.44M TEAC Floppy Drives
- 420MB Western Digital IDE WDAC2420 HD
- S3-805 VLB 1MB Windows Accelerator
- KFC 14" 1024X768NI 0.28DP Monitor
- Premium Digital Mini Tower 230W PS
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33SXIntel-$1139
33DXIntel-$1277
40DXAMD-$1108
50DX2AMD-$1241
66DX2AMD-$1289
66DX2Intel-$1301

READY TO GO

Dare to Compare
[illegible]
- Processor............ 38.13
- Video.................. 3659.41
- Disk.................... 1015.00
DOSMark.............. 609.83
Graphics WinMark.. 8.48
Disk WinMark......... 793

Test result based on our 66MHz system.
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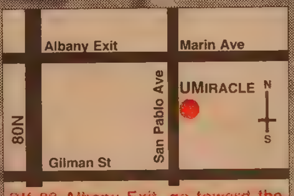

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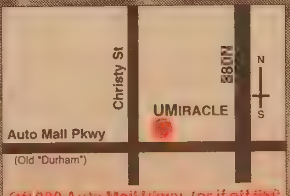

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486 AIR-MI ISA VLB 256K - 3 VLB slots, Upto 128MB by 72Pin, ZIF, P5 OD support, Bus-master, VLB IDE, FD, 2S/P/G, Power Saving Mgmt, U.S.Quality	$175
486 AIR-MIS ISA VLB 256K - 2 VLB slots, Upto 64MB by 72Pin, ZIF, P5 OD Support, Bus-master, VLB IDE, FD, 2S/1P & VLB SCSI-2 w/ Adaptec 6360 chipset, and EZ-SCSI software driver, U.S.Quality	$215
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486 Micronics EISA VL BUS 256K, IDE, 2S/P/G, Full size, Flash BIOS, Upto 64MB by 72Pin	$450
486 ISA PCI - 3 PCI, 5 ISA Slots, ZIF, P5 OD Support, Intel Saturn ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas onboard Battery, Phoenix BIOS, onbrd PCI NCR SCSI-2 Controller, Complete software drivers for OS/2, NT, UNIX, 256K/512K	$245/325
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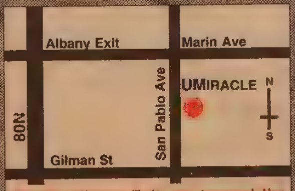

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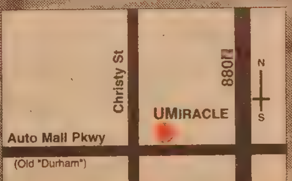

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REALIZABLE FANTASIES • BY JIM WARREN

About Hotels, Correctness, Speech & Stuff

Prior to the last year's preoccupation with pushing computer-assisted government-access through the legislature, this column focused on viable technology fantasies—things that haven't been done, but could be. Now!—and now, again...

Hostel Ideas

When making hotel reservations, make sure that they are "TC"—technologically correct: Do their rooms have RJ-11 phone jacks for your laptop's modem cord? Do they have fax send and receive options? Do they *not* charge for 800-number calls? Applaud TCness—or complain about its absence—on their service-quality response cards.

And data-modems, fax-modems, and datacomm software need to facilitate often-changed out-dialing prefixes and user's-location area codes. They also need to allow for a calling-card number, plus the number being called, plus options for long pauses between each. Ideas brainstormed with Jay Thorwaldson at BBScon.

And why don't all datacomm programs include the option of an immediate-dial fax or data number? Most appear to require that the fax or data number first be entered in a fax directory or datacomm directory, and will *then* allow you to use it the one time before you delete it from the list. *Blegh!*

A hot idea: If a hotel's fire alarm goes off, it'd be helpful for all TV channels on each television set on each floor to switch to displaying (a) the escape route for that floor, ideally including a "You are here" marker for the television set, and—if available—include text information describing the fire or a floor plan indicating the fire site and its extent. Handy for everyone; especially valuable for the hearing-impaired. This idea from Woodside's Nancy Christian.

Authenticating The Right Stuff

How can you tell whether a program or text file has been changed without your knowledge? Maybe it's just a single flaky hardware-bit that inverts—in the most significant digit of your tax return. Surely the IRS auditor will understand.

Or maybe it's expensive commercial software that you bought from some sleazy company that sneaks updated versions into their retail distribution without notice and without changing release numbers—so you can't tell whether you have a bad "current release" or a good "current release." The practice is much-too-politely called "slipstreaming," illustrated by some WordPerfect releases. Lotus and Microsoft have left release numbers unchanged but appended an ambiguous alpha-character to their modified modules. Caveat Emptor!

If you can't trust the release number nor the size nor the creation-date, then how can you check the "purity of essence" of a file?

Some elderly operating systems of Long Ago had a "directory" command option that would display a file's checksum or hash-code computed on the current contents of the file. Some checksums were trivially untrustworthy. Well-designed hash-codes were much more reliable, but still subject to at-least-theoretical error.

If unkind comments are keyboarded, but never published on paper, are they speech or writing?

Most folks conduct online discussions like spoken dialogue.

Slibel & Lander

What's it called when someone—speaking in an electronic conference—posts a remark that falsely maligns a person? "Sliber?" "Landel?" (Memory aid: Slander is spoken; libel is "literary," uh, written.)

If unkind comments are keyboarded, but never published on paper, are they speech or writing? Most folks conduct online discussions like spoken dialogue.

But it could be published.

But it usually isn't even printed, much less published.

But public postings are often circulated analogous to newspaper publication.

Ahh, evermore labors for litigators.

Could online publishing possibly impact the laws of libel? Such laws certainly restrict freedom of the press, and the twentieth-century US press is *much* more polite and balanced than in the nation's first century.

That two hundred-year-old parchment says, "Congress shall make no law... abridging the freedom of speech, or of the press; of the right of the people peaceably to assemble, and to petition the government for a redress of grievances."

Perhaps the statutory restriction on the Constitutional freedom of the press regarding libel came about at least in part because publishers had much greater ability to distribute their allegations than possibly libeled parties had for rebuttal. But, online, an individual has just about as much ability to refute allegation as an online publisher has to make them.

(Based on a comment and article by the Electronic Frontier Foundation's Mike Godwin [mnemonic@well.com].)

Loose Ends

- Does the Disabilities Act mandate that

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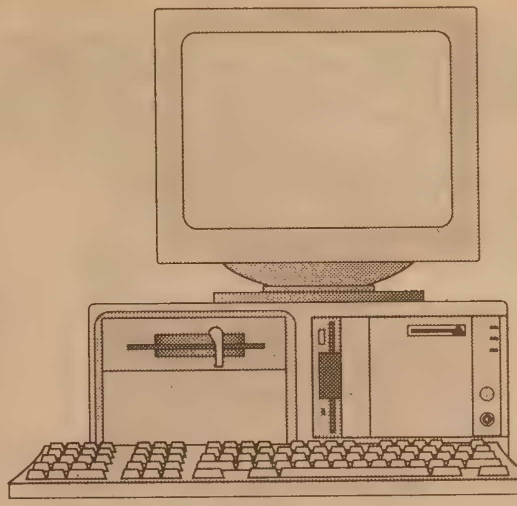

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Fantasies *continued*

companies provide left-handed computer devices for the "handedness-challenged?" And, is there any truth to the rumor that poor folks must now be called "economically challenged," and short people, "vertically challenged"? These things have been gettin' outa hand ever since school janitors became Custodial Engineers (but without wage increases).

- Ask not what your country can do for you. Ask, instead, what your country should *stop* doing "for" you. Like forcing foreign manufacturers to charge US consumers higher prices than they offer in other nations. Like trade barriers that imply American business and workers are incompetent to compete in a world market. Like prohibiting economical import of active-matrix displays—which prompted Apple and others to move laptop-computer manufacturing offshore in order to offer state-of-the-art displays, or else limit themselves to offering noncompetitive products.

And like pouring half the national deficit, uh, budget into the defense pork-barrel and excusing it by publicizing the occasional consumer-product benefits. If the government wants to fund nondefense—or non-space—technological development, then do it directly; not as incidental fall-out, like Corning Ware and Tang.

- Back to the drawing boards: You know those fancy, low-wattage fluorescent light bulbs that cost $25 or $30 or more, apiece? Like Matsushita/Panasonic's EFT18LE-T—an 18-watt screw-in that replaces a 75-watt incandescent? Well, in a fit of political correctness, I bought a batch. Two-thirds of 'em died within a month—in the first brown-out. The design must have violated a fundamental rule of engineering: Assume adversity!
- Shouldn't "gigabyte" simply be called "bigabyte"—or maybe, "overbyte?" Should Intel microprocessors' infuriating 640K limit be called "lillibyte"—after *Gulliver's Travels'* Lilliputians? And when political candidates give online responses to voter questions over the computer networks, are those "sound-bytes?" These questionable contributions are blamed on Kings Mountain's Jay Thorwaldson. ■

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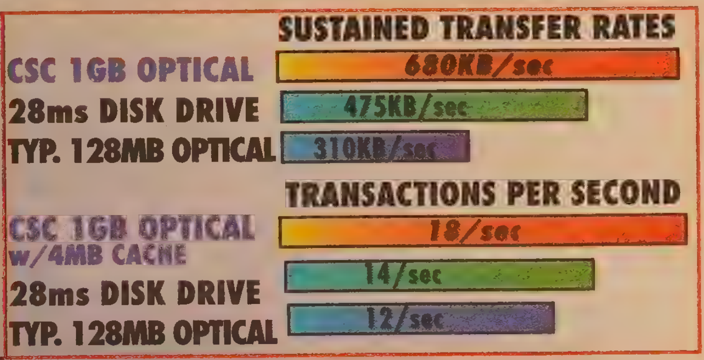

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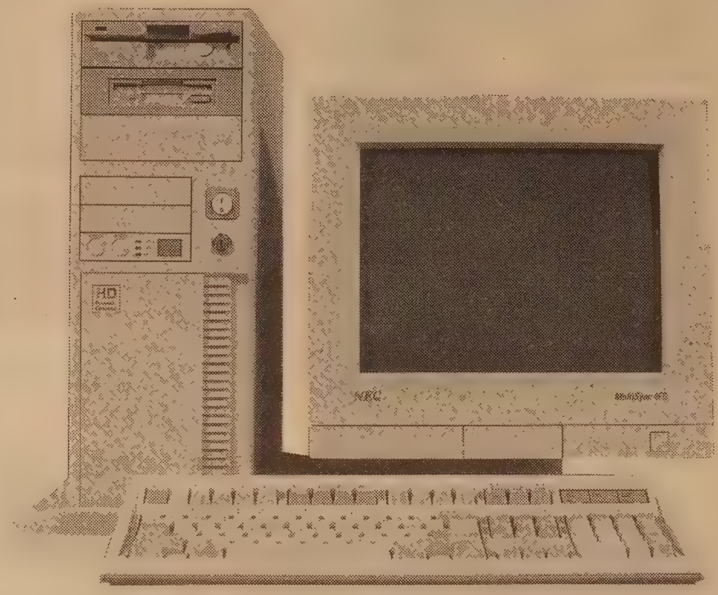

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- *8MB 72-pin RAM (max. 128MB)*
- *2-16550 High Speed Serial Ports*
- *1 Parallel Port*
- *1.2MB FDD*
- *1.44MB FDD*
- *540MB SCSI HDD*
- *NCR PCI SCSI Controller*
- *Orchid Kelvin 64 PCI Video Card/2MB*
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M.S. DOS 6.2	***$45***
M.S. Windows 3.11	***$48***
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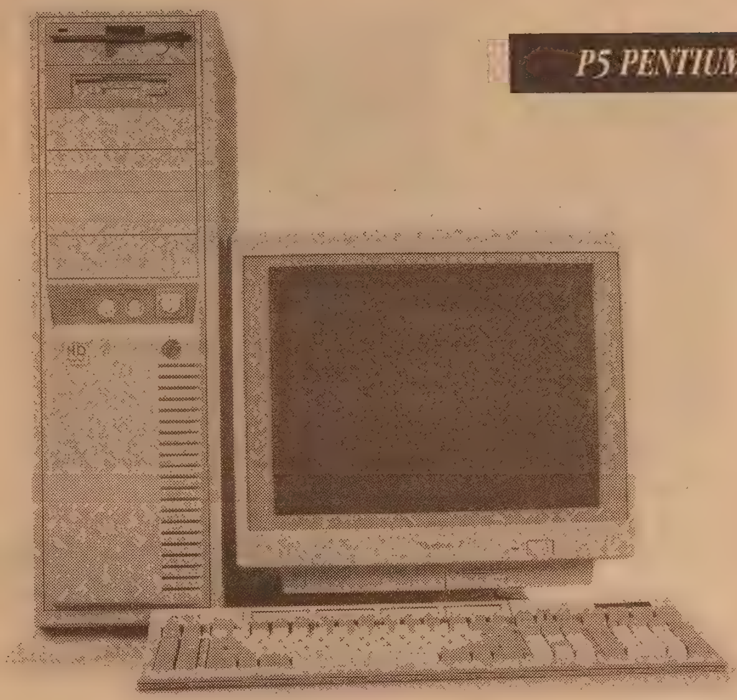

P5 PENTIUM Processor PCI System

- *Intel Pentium Processor*
- *16KB Internal Cache*
- *256KB External Cache (Max 512KB)*
- *8MB 72-pin RAM (Max 192MB)*
- *1.2MB FDD*
- *1.44MB FDD*
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- *345MB SCSI HDD*
- *2-16550 UART High Speed Serial Ports*
- *1 Parallel Port*
- *Diamond Stealth 32 PCI/1MB*
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- *101-key Keytronic Keyboard*
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- *Free Mouse Pad*
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60MHz	***$2265***
66MHz	***$2395***

Green P5 PENTIUM Processor Local Bus System

- *Intel Pentium Processor*
- *16KB Internal Cache*
- *256KB External Cache (Max 512 KB)*
- *8MB 72-pin RAM (Max 128MB)*
- *1.2MB FDD, 1.44MB FDD*
- *32-bit VL-B IDE Disk Controller*
- ***424MB IDE HDD***
- *2-16550 UART High Speed Serial Port*
- *1 Parallel Port*
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- *Mid Tower case w/230w power supply*
- *15"1280x1024 Non-interlaced Flat Screen Monitor*
- *101-key Keytronic Keyboard*
- *Microsoft Serial Mouse*
- *Free Mouse Pad*
- *Free PFS: Windows Works*

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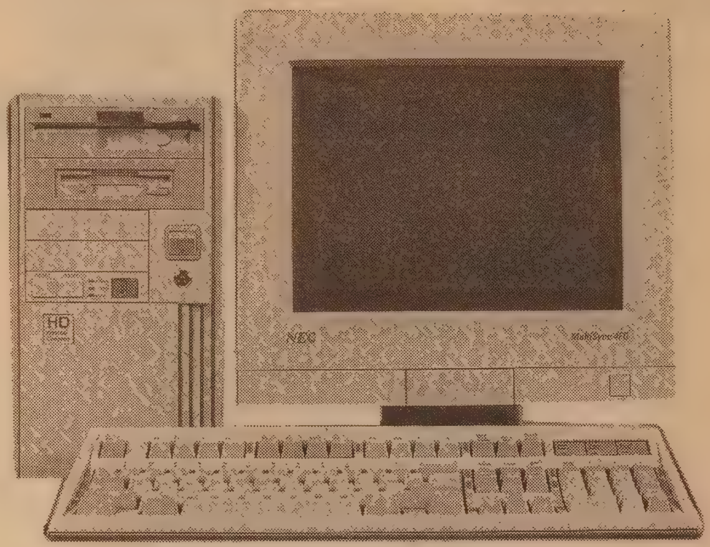
SX-33	***$1005***
DX-33	***$1155***
DX2-50	***$1185***
DX2-66	***$1255***



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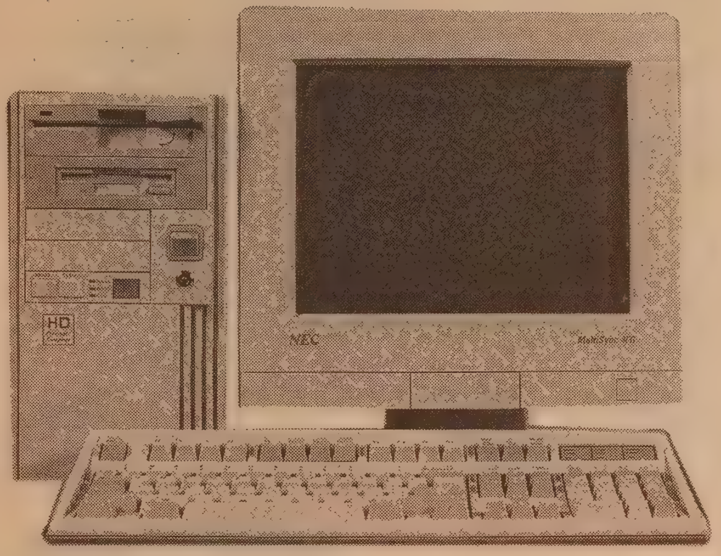

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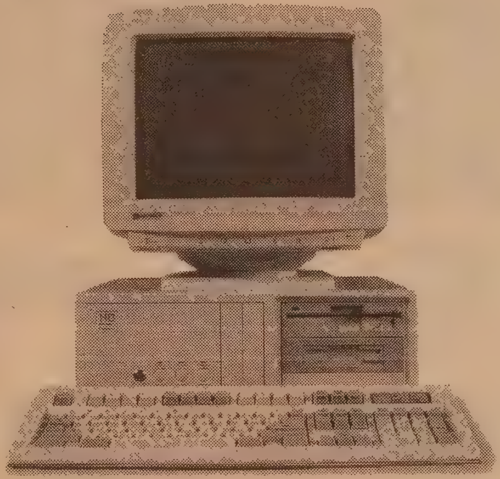

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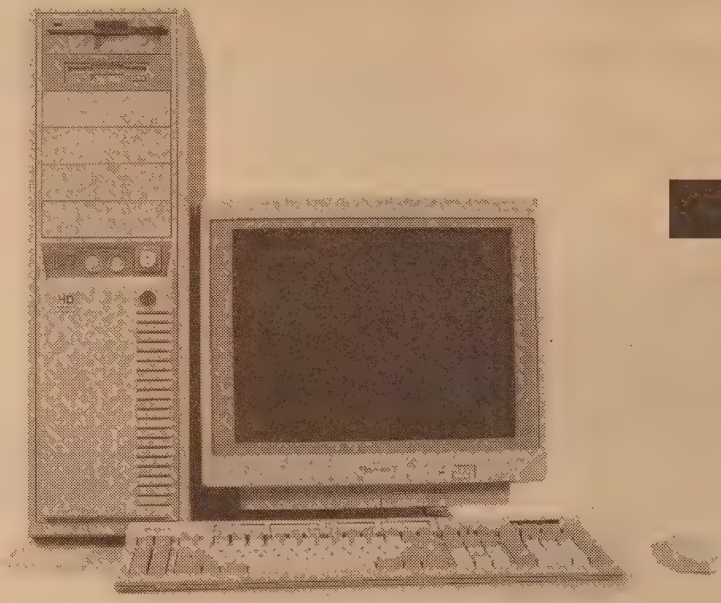

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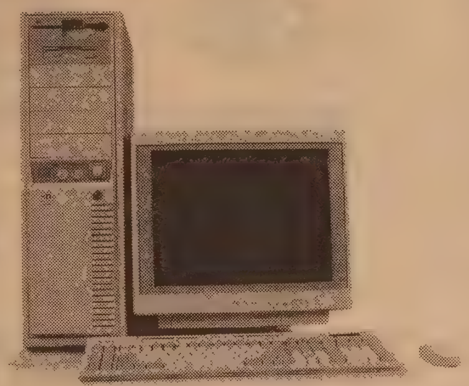

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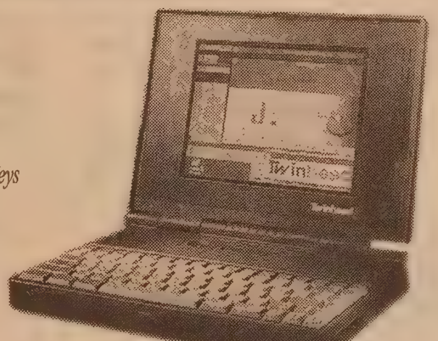

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PALMTOPS • BY MITSU HADEISHI

Sending A Fax While On The Road

Plus: What The Newton Teaches Us About PDAs And PCMCIA News

Smith Corona HandiFax 1000

The ability to send faxes is an oft-touted feature of the Apple Newton and other higher-end PDAs (when combined with a portable fax modem or PCMCIA card). One problem with this is that when you are on the road, phones with modular jacks are not always available. Although many motels and hotels are changing their phones so that fax modems can be attached, not all support this. In addition, you may be far from your hotel room when you need to send your fax, and the only convenient phone may be a pay phone, which does not have modular jack access. This situation can be alleviated via the use of an acoustic coupler; this is a device that allows you to connect to the phone line through an acoustic link to the phone handset. Unfortunately, an acoustic coupler is usually a bulky device, appropriate for use in a hotel room but often not particularly convenient to set up in a phone booth.

> The HandiFax 1000 is relatively special-purpose —it is a portable fax sending device and little else.

Enter the Smith Corona HandiFax 1000 to fill this need. The HandiFax 1000 combines a 256K pocket organizer with a built-in fax modem and acoustic coupler. Measuring only 7.75" x 3.5" x 1", it fits easily in a purse or jacket pocket. How could all that be squeezed into a hand-held device? The unit is cleverly designed with a tiny pop-up microphone and speaker embedded in the sides of the keyboard, placed just the right distance apart so you can lay a typical phone handset onto them. Because the microphone and speaker pop up, they hold in place the handset as you send the fax. Like a normal fax machine, it also has a modular phone jack for noise-free connections when that is available. Of course, with 256K of RAM, you can only send faxes; there is not enough RAM for it to be able to receive.

In addition to its faxing capabilities, the HandiFax comes with basic organizer features: a simple phone and address book, a notepad, a scheduler with alarm, and a calculator. These capabilities are good enough for basic use, though there are some curious limitations; only 16 characters for the name field in the address book, for example, and no comment field; the memo pad is limited to 120 pages of information, and so forth. This is adequate for many people, however, and since the device is intended primarily as a portable fax sender, for many these feature oversights will be of little importance.

How good is the acoustic coupler? Since the acoustic coupler does not come with the usual "cups" used to shield the phone handset, you have to rely on the room being somewhat quiet for transmissions. However, to deal with this, there is a built-in noise canceling circuit that seems to work fairly well. The HandiFax will also test the line before it begins to send the fax, making sure the line quality is good enough for an accurate send (it will ratchet down the speed if the line quality is not good enough). The first time I attempted to send a fax it failed to connect with the machine on the other end; however, at the time I did not have the handset positioned accurately enough. After adjusting the handset a little, the fax went across flawlessly the second time. It seemed as though with a little practice it would be quite easy to get used to positioning handsets on the coupler for pretty good transmission accuracy. An advantage to this unit's design is that you can use a larger variety of phones; even some flip-top cellular phones, not just those with traditionally shaped handsets, as long as the mouthpiece and speaker are separated by the standard distance.

The keyboard is made of square, rubber keys which are solid to the touch and easy to locate. However, the machine itself seems to lose characters if you type too quickly; one has to type relatively slowly. The display is five lines by fifty characters–a bit small for text entry and display, though adequate to handle the organizer functions such as the address book or scheduler. One complaint is that the display can be difficult to view. Adjusting the contrast helps to some extent, but I have seen much clearer LCD screens on other palmtops. The layout of the controls is simple and functional, while the user interface, though plain, works well enough for the rather small number of organizer features available.

This is relatively special-purpose—it is a portable fax sending device and little else. If that's what you need, then this is the right machine for you. There aren't any other machines in its price range offering these features. One drawback, however, is that it is not expandable in any way (no card slots), what you see is what you get. A PC and a Mac connectivity package is available, however.

Back To The Newton

Many of you probably know a satisfied Newton user, but I bet a lot more of you know at least one archetypical Newton user: someone who was very enthusiastic about their machine for the first month or two, but who now uses it as a paperweight. What happened to these folks, and why did they give up on their Newtons despite great

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initial faith? I decided to surf the Net as well as talk to a few of them in person to see if any lessons could be learned about what not to do when designing a PDA.

> **What happened and why did they give up on their Newtons despite great initial faith?**

Before I list what they didn't like about their Newtons, let me talk about what they did like. More than once a former user made positive comments about the size, shape, and weight of the MessagePad 100. It seemed to these folks that anything larger (for example, the new Motorola Envoy) might be too big for true portability. (Unfortunately, the new, improved MP110, though it has a faster processor and an updated ROM, is heavier than the original MP100.) Some commented that the improved speed and accuracy of the new ROMs over the originals do help make the machine more usable; in particular, the "deferred recognition" in the new ROMs helps to enable the user to quickly take notes and later review and recognize the handwriting at their leisure. However, these improvements were not enough to keep many users happy enough for them to continue using their machines.

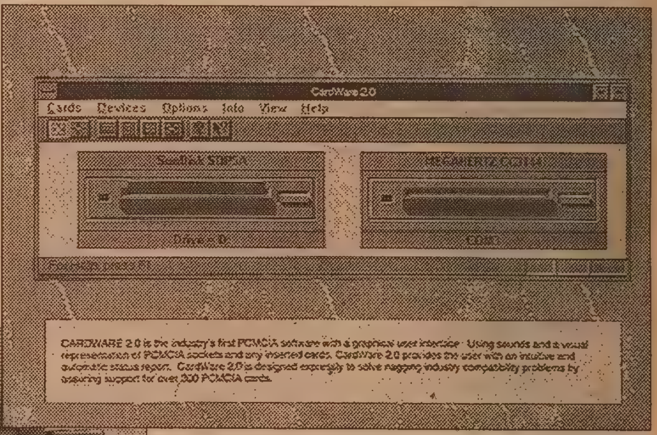
Battery life was one of the concerns that caused users to significantly curtail or even stop using their Newtons altogether. One user commented that the batteries would drain in a few weeks regardless of whether he used the machine heavily or not; another was emphatic that a few weeks was not long enough. Use of rechargeable batteries is discouraged by Apple; the variation in voltage of rechargeable batteries could cause damage to the Newton, though several people on the Net have said they used rechargeable batteries and they work fine, if you use them carefully and do not overcharge them (though typically they only get two or three days of use per charge).

A surprising complaint, however, was that the user interface was simply too clumsy. Some commented that the machine was too slow not only for data entry but also for data retrieval because there were too many nested submenus to navigate through for certain tasks. It simply took too long to do something that one wants to be able to do very quickly, like look up a name in the address book. One person commented that when the address book had a large number of names in it, the unit slowed to a crawl when he wanted to pull out a name. One of the cardinal rules of user interface design is that simple things should be easy, and complex things should be possible—but in this case, apparently, even simple things, though possible, were not easy enough.

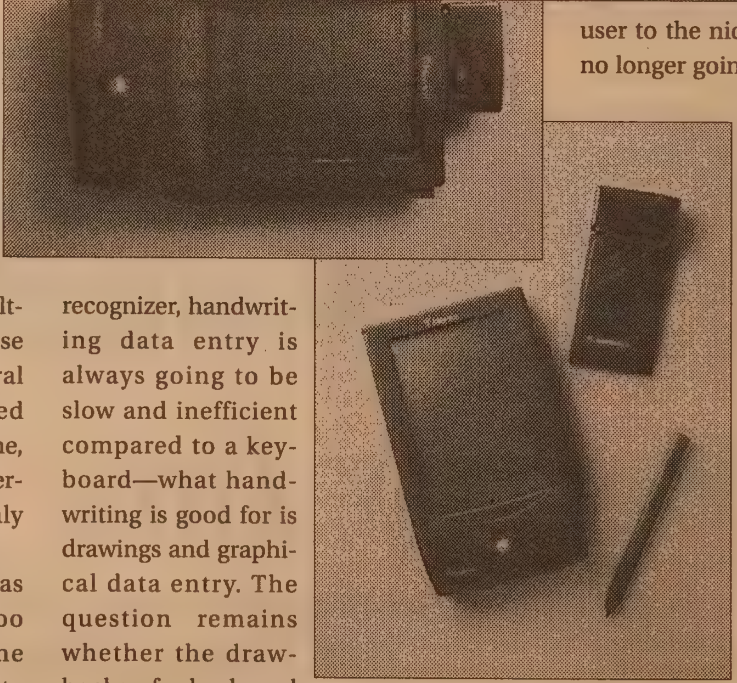
Of course, we've all heard of the problems with the handwriting recognition; this applies not only to the Newton but to every pen-based handwriting recognizer out there. The problem is so severe that the Motorola Envoy does not include any handwriting recognizer at all; you enter data by a little on-screen keyboard. I won't dwell on the details of this problem. Suffice it to say that even with the fastest and most accurate handwriting recognizer, handwriting data entry is always going to be slow and inefficient compared to a keyboard—what handwriting is good for is drawings and graphical data entry. The question remains whether the drawbacks of a keyboard are worth the inconvenience of using handwriting for data retrieval and entry. The jury is still out on this one, but the evidence is mounting that many people simply don't like to enter data using handwriting recognition, particularly if it is not very accurate.

A number of other things arose as well; the connectivity with PC-based personal information managers was weak at best. Some people found it difficult and cumbersome to synchronize their network PIMs with their Newtons. Another former user commented that a network PIM is far more useful since it is integrated with email and capable of synchronizing with other users instantly; as a result, there is less and less of a compelling need for the Newton. One person mentioned that the Newton was useful for sending faxes while on the road; a job that the HandiFax 1000 reviewed above could also do for less money.

After all this, where has the Newton been successful? Apparently Apple has shifted emphasis away from the general user to the niche vertical market; they are no longer going to be pushing the Newton as hard as a general-purpose PDA, but more as an assistant for professionals to get specific jobs done. A "doctor's PDA," a "salesman's PDA" and so forth. This is, of course, the place where most pen computers have been selling in the last few years, so it is not too surprising that Apple wants to concentrate there in the future. And of course, we should not forget that there are still many satisfied users of the Newton out there; just not very many of them, if recent poor sales figures are any indication.



CARDWARE 2.0 is the industry's first PCMCIA software with a graphical user interface. Using sounds and a visual representation of PCMCIA sockets and any inserted cards, CardWare 2.0 provides the user with an intuitive and automatic status report. CardWare 2.0 is designed expressly to solve nagging industry compatibility problems by assuring support for over 300 PCMCIA cards.



PCMCIA News

IBM has announced its new high-capacity flash RAM PCMCIA Type I cards: using the

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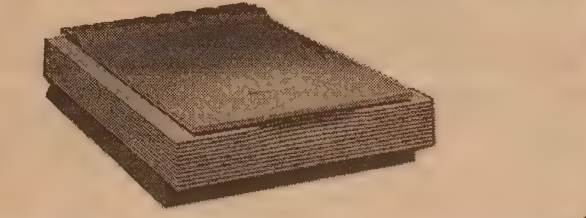

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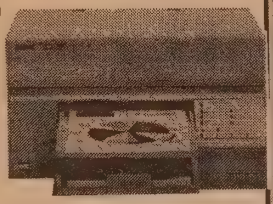

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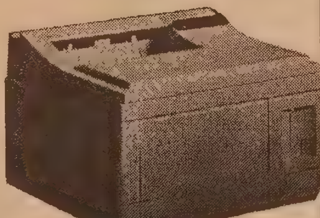

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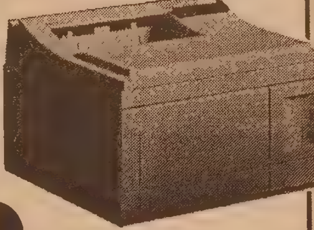

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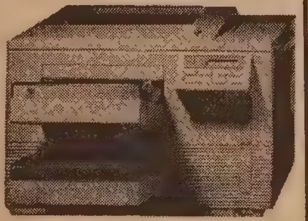

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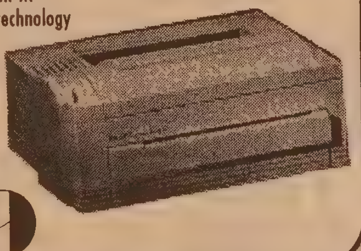

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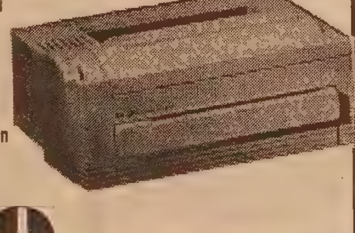

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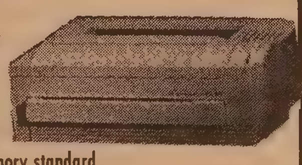

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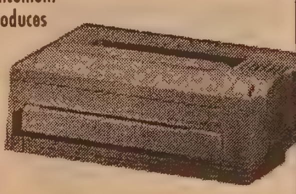

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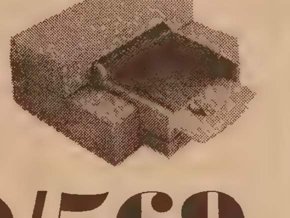

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next generation of flash memory, they are compatible with PCMCIA release 2.0 specifications. The new cards are available, in 4MB, 8MB, and 16MB sizes, only to OEMs and resellers at a little over $55 per megabyte (making the cost to you slightly higher).

Award Software has announced the release of CardWare 2.0, a software package designed to make PCMCIA compatibility issues easier. The software will automatically read the configuration of any newly inserted PCMCIA card (even those inserted while the computer is still running). The software currently works with more than 250 cards, and will automatically configure or reconfigure a system without need for rebooting or manual reconfiguration. CardWare uses a technique called "CIS Parsing" (or Card Information Structure parsing), which is intended to allow the software to automatically read the configuration of new PCMCIA cards as they are released. It comes with a graphical user interface for ease of use.

Megahertz Corporation has announced a combination PCMCIA EthernetModem card as well as a new 28.8kbps PCMCIA v.34-based modem. The EthernetModem combines a 10BaseT or 10Base2 Ethernet adapter with a 14.4kbps v.32bis data/fax modem on one card, allowing portable and palmtop computers that have only one PCMCIA slot to have both Ethernet and modem functions at the same time. Its 28.8kbps v.34-based modem card is scheduled to be released in fall of this year, after the new high-speed standard is approved by the International Telecommunications Union. The v.34 card will incorporate Megahertz', XJACK connector.

> **A surprising complaint (about the Newton), however, was that the user interface was simply too clumsy.**

Socket Communications, Inc., maker of the EA series PCMCIA Ethernet adapters, has reduced the list prices on its Ethernet cards from $299 to $249 for tits EA 10BaseT adapter, and from $369 to $299 for the EA+ 10BaseT/10Base2 adapter. The EA series Ethernet adapters are compatible with Novell NE2000 drivers, which makes them automatically compatible with NetWare, NetWare Lite, LAN Manager, Banyan VINES, Windows for Workgroups, LANtastic, PC LAN, UnixWare, SCO UNIX, Windows NT, and Chicago. ■

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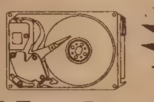

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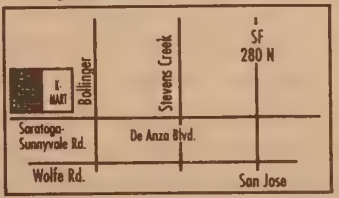

LAPTOPS • ED KAHN

A Portable Full-Page Scanner

With The Emergence Of Great Fax Software And Fax Modems, A Portable Scanner Was The Inevitable Next Step In The Evolution Of Portable Computing

Until recently, I have had to warn readers that fax software was great as long as you did not expect it to take the place of a standalone fax machine. While there are definite advantages to fax software over a dedicated fax machine, there is one great drawback: you simply cannot receive a form, fill it out, and fax it back. I know, it is technically possible, but it takes away from the point and convenience of working with faxes. All too often, I have no easy option except snail mail for returning the completed form that was faxed to me.

Helping to provide a solution, Logitech has introduced its new ScanMan PowerPage portable scanner. I have been working with it the past few days and am delighted. But I must confess that I have been using it on my desktop system, which has two parallel ports and significantly more memory than my portable computer. To get the most out of the ScanMan PowerPage, you need to have at least 8MB of RAM; you can get by with 4MB, but will need an 8MB swap file in Windows. This means that you must have an extra 8MB of free space on your hard drive.

The scanner itself measures less than a foot long by less than 3" x 3", making it small enough to fit inside your briefcase. It comes with a cable that attaches to the parallel port of your computer. A power supply plugs into a wall outlet and then into a port on the cable. You can also run the scanner from a rechargeable battery pack ($79).

Installation of the necessary software to make it all work is simple. You plug the cable from the scanner into the parallel port on your computer and turn on the power. Next, you install the software, which works from within Windows. This also is simple, as you are guided through the installation and there are few choices you need to make. If you choose to have the PowerPage Control Center installed into your startup sequence, the features of the scanner are available to you from within any application.

In addition to its convenience for sending faxes that did not originate from one of your applications, there are many other features that make ScanMan PowerPage a useful peripheral for any computer, portable or not. You can easily scan documents—sheets of paper or material contained within books—into other applications, such as a word processor. For instance, I was able to insert several pages of printed text into an existing AmiPro document. It was simple, but that was also when I ran into memory problems and discovered that even though I have 8MB of RAM, I needed a swap file if I was going to scan in whole pages of text. Partial pages worked great, but whole pages simply needed the full 8MB.

A final bonus of ScanMan PowerPage is its ability to function as a copy machine.

Scanning in a document is easy. You simply open your word processor, place the cursor where you want the new text to begin, and call up the scanning software. Next, insert the page into the scanner and click the text button on the screen. The rest is automatic! Graphics can be brought in just as easily, if your underlying software is TWAIN compatible. If you plan to scan in text from a book, slip the top part of the scanner off of its base and place it on the text you want to scan. The wheels in the scanner move it along at the correct rate. All you need to do is make sure the scanner stays straight. In many ways, this scanner offers as much as larger flatbed scanners and certainly runs circles around handheld models.

While I like the idea of scanning from books, magazines, and newspapers into my word processor and being able to manipulate the text, I cannot report great success in this area. Optical character recognition (OCR) software is still relatively unsophisticated. Oddly, however, when I scanned in pages that had been generated by my computer the success rate was nearly 100%. While this software isn't ideal yet, it is a real time saver when it works.

An added bonus of ScanMan PowerPage is its ability to function as a copy machine. Again, call up the software, insert the material to be copied, click the copy button, and a wonderfully clear image comes out from your printer. With my laser printer, copies are as clear as originals. You can copy, scan, or fax up to ten pages with the optional cut sheet feeder ($129).

The ScanMan PowerPage comes with FotoTouch Color software, giving you the ability to manipulate and doctor images that you scan. This is similar to other graphics software, but works perfectly with the images scanned by Logitech products. You can enlarge, reduce, crop, edit, highlight, color, and more with this software. Because of software like this the courts have stopped allowing photographs to be used as evidence. It is simply too easy to alter photos. Unlike some of the larger scanners, however, this unit only scans in black and white (and numerous gray shades). If you need to process color images, this is not the unit for you.

Faxing a document from this scanner is as easy as copying. The only difference is that you click the fax rather than the copy button. The fax software automatically opens, letting you add a cover sheet generated by the computer. The file will also be saved in the computer for later transmission or for archival purposes. Logitech's ScanMan PowerPage is just what I have wanted. Logirtech also includes Win Fax Lite, a stripped down version of Delrina's WinFax Pro, in case you do not already have fax software. ■

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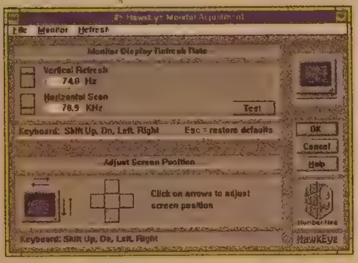

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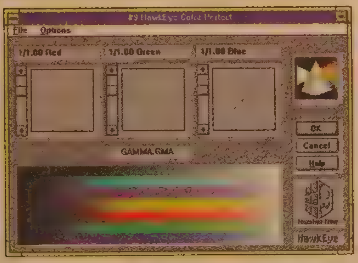

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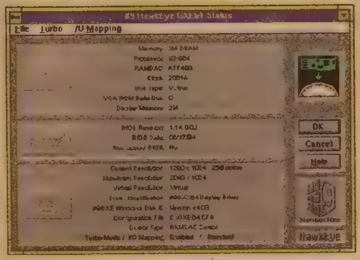

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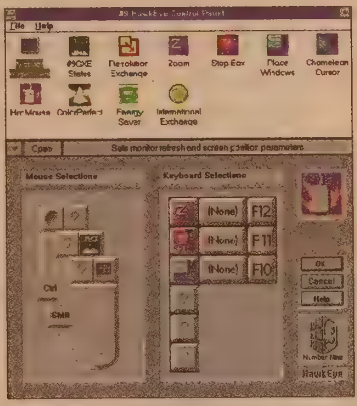

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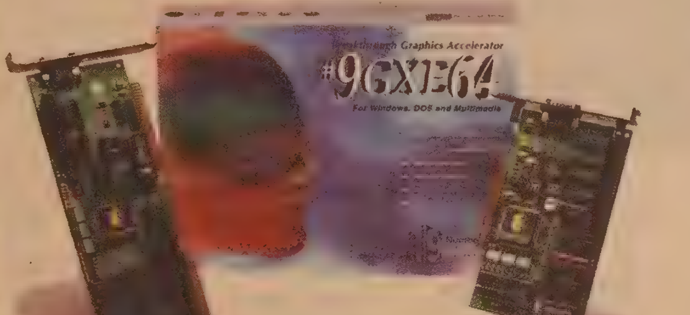

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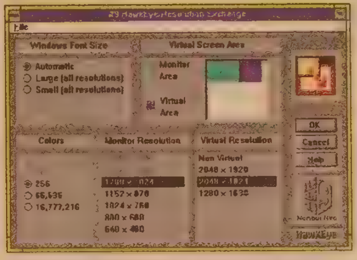

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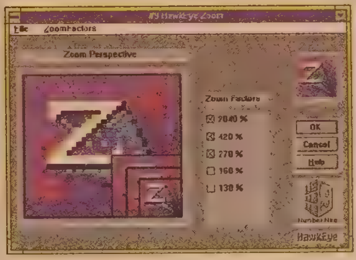

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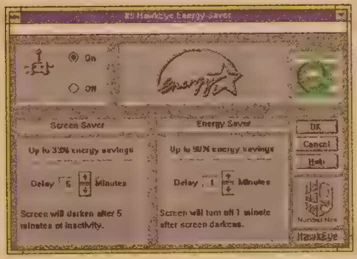

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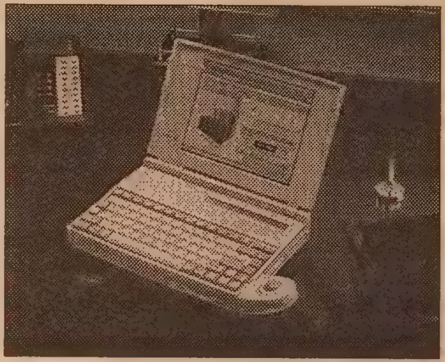
Computer Of The Month

Toshiba's High End 4700CS

This month, I highlight a top-of-the-line computer. While there are many full-featured portables on the market, Toshiba has long been a market leader. The 4700 series comes in two models. The CS features, dual scan, passive matrix color display, while the CT has an active matrix display and is a bit more expensive. Both models come with either 200MB or 320MB hard drives and two PCMCIA slots. I examined the least expensive model of the 4700 series, the 4700CS with a 200MB hard drive and dual scan technology. Nevertheless, it carries a list price of $3699, which was recently reduced about 19%.

You might expect to get a lot for this price and Toshiba will not disappoint you. The processor is an Intel 50MHz 486 DX-2. If this is not fast enough, you can get their newest high-end model, the 4800, which features a 75MHz DX-4. The 4700CS, like the rest of the series, comes with 8MB of RAM. This is the first machine I have seen that comes standard with this much memory, but I must say that increasingly I find a need for this much memory.

Toshiba has long made the best keyboard in the business. Nowadays, almost everyone has copied their layout. In some ways this is like the early days of automobile design when manufacturers were still trying to determine the best way to arrange gear shift levers. Some worked in the standard H pattern, while others used a mirror image of that pattern, placing reverse rather than first gear in the lower left corner. Eventually, everyone adopted a standard "interface." Toshiba still stays a step ahead. The standard keyboard on portables do not have an Fn key and if you plug a PS/2 keyboard into most portables, you would not have access to the Fn key. But Toshiba now gives you several alternative ways to replicate this key on its keyboard.



The screen on the 4700CS measures 9.5" diagonally and provides an excellent display. Of course, you can easily attach an external monitor and then display on either the internal or external screen or both. This computer was designed for multimedia with a focus on video. The video is local bus and has an accelerator, both of which make for faster display.

Toshiba has long made the best keyboard in the business. Nowadays, almost everyone has copied their layout.

The multimedia capability of this computer is emphasized by a built-in microphone as well as jacks for plugging in both an external microphone and speakers. Software lets you add sound to other applications and also lets you output to video.

The 4700CS is also designed to run Windows, which comes bundled. Accordingly, in addition to a dedicated mouse port (and the keyboard port), a track ball is included. It works well and I might even end up using this one rather than adding a separate mouse. Toshiba's design team always stays ahead of the competition.

Toshiba's documentation is excellent, as always. A small Getting Started manual walks you through what you need to know to begin. A hefty reference manual takes you deeper into the details of the computer. If you are on the go, the software containing all of the documentation is easy to access. Hypertext makes it easy to move from one place to another and is actually easier to navigate than the printed documentation.

A final feature of this Toshiba is the three-year parts and labor warranty. Not only does this beat anything else available in the industry, but there are additional, optional plans to suit your needs. These include things like door-to-door service and special coverage for the display, which is expensive and if broken can break you as well.

As you might expect, there is more to say about the Toshiba 4700CS, but be assured that portability was at the core of its design. It weighs less than 7lbs. and has a nickel metal hydride rechargeable battery pack that recharges in an hour and a half. If you are in the market for a high-end portable computer, the 4700CS may be just what you are looking for. ■

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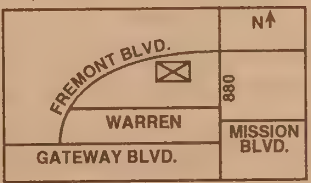

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LANS • BY PETER JOHN HARRISON

Connecting Laptops To The LAN

Tips To Help You Select PCMCIA Network Cards

One of the challenges facing the modern LAN administrator is providing support for users who need to take their computers with them. Five years ago this was pretty easy: you bought a Compaq Portable (basically a desktop PC, complete with disk drives and monitor, crammed into a box with a handle on it), and made sure your workman's comp plan covered back injuries. Since the old "transportables" included standard PC expansion slots in them, the same LAN cards could be used in both desktop and portable computers.

With these earlier portables, a pocket adapter, plugged into the parallel port, connected you to the network. Portable computers these days are notebook-sized, weigh one-fifth as much as the old Compaq Portable, and no longer have ISA expansion slots. Rather, most laptops sold today have a PCMCIA (Personal Computer Memory Card International Association) slot, which can be used to install extra memory, a modem, or a LAN card.

PCMCIA LAN cards have several advantages over the older pocket adapters. For starters they're a lot faster. Ethernet LANs operate at 10MB per second. PCMCIA and ISA bus adapters, with their direct connection to the data bus, can take better advantage of that speed. Pocket adapters are limited to the speed of the computer's parallel port, which is designed to interface with slower peripherals, like printers. PCMCIA cards are also less bulky and lighter, don't require an external power adapter (as most pocket adapters do), and are priced competitively with most popular pocket adapters.

Although PCMCIA LAN cards have many advantages, it is important to know what to look for when you go out to buy one.

The PCMCIA standard is fairly new, and not all PCMCIA LAN cards work with all PCMCIA slots. PCMCIA Type 1 slots, for example, will only support memory cards, not modems or LAN cards. Most (but not all) modem and LAN cards work with a Type II or Toshiba Type III PCMCIA slot. Typically, PCMCIA LAN cards have a partial list of compatible laptop systems printed on their packaging, but you should still make sure you have the option of returning the adapter if it doesn't work with your laptops.

You should also look at the external connector. All PCMCIA cards have some sort of connector to attach a "dongle" or LAN cord to the edge of the card that protrudes from the PCMCIA slot. The best cards have locking connectors that you have to pinch before they can be pulled out of the connector. The PCMCIA card I bought last year doesn't have this feature, and is always pulling free of my laptop.

Finally, make sure the card you buy includes drivers for your LAN software and the right kind of connector for the kind of LAN wiring you have, i.e., 10BaseT or 10Base2 (also called Thinnet and Coax).

I've tried out several PCMCIA LAN adapters with different laptops and network systems. Here's a partial list of the adapters I've tried out.

Eagle is the company that manufactures Novell network adapters. If your shop is a True Red Novell shop, the Eagle NE200 PCMCIA adapter is the card for you. The NE200's best feature is its dongle-less 10BaseT connector, which is a simple line cord with a locking connector at one end and an RJ-45 phone connector at the other. Cutting out the external box, or dongle, means there's less stuff to pack into your laptop carry bag and less stuff to clutter up your desk. (Unfortunately, the NE200 for Coax isn't anywhere so neat. Coax adapters all have some sort of dongle.) The NE200 dongle is the only adapter I've seen that requires an external power supply.

The hardware installation for the NE200 is like any other PCMCIA card—very easy. With most laptops all you have to do is open a little door and slide the card in, then plug in the network connector. Once the network card is installed, you can turn the system on and use the NE200 Install program to copy the drivers you need to your hard disk, and configure your network card.

The NE200 comes with Novell and NDIS drivers (for Artisoft Lantastic and Microsoft Windows for Workgroups), and an Install program that'll copy it all to your system. If you're using a Novell network, the Install program will set your drivers up for you, but you'll have to configure the NE200 manually if you're using Lantastic, or some other network that uses NDIS drivers.

The least expensive network card I tested was the Linksys Combo PCMCIA EthernetCard. The highlight of the Linksys card is that it comes with a multi-function dongle that supports both 10BaseT and 10Base2/Coax connections. The Linksys card also has the widest variety of drivers, including NDIS, Windows NT, and TCP/IP packet drivers, and a locking connector on its dongle.

Most LAPTOPS SOLD TODAY HAVE A PCMCIA (PERSONAL COMPUTER MEMORY CARD INTERNATIONAL ASSOCIATION) SLOT, WHICH CAN BE USED TO INSTALL EXTRA MEMORY, A MODEM, OR LAN CARD.

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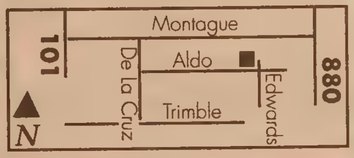

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The only drawback I found with the Linksys card is that it doesn't have an installation utility, so you have to copy the software drivers to disk, modify the CONFIG.SYS file, and create a batch file to load the network. There's extensive documentation on disk to help you do this though, including documentation for Novell, Baynan Vines, Artisoft Lantastic, Sun PC-NFS, Windows NT, and half a dozen other network systems. Linksys is definitely my choice for networking flexibility and price.

For versatility in a single card, though, look at Xircom's Creditcard Ethernet+Modem card. As the name suggests, it's an all-in-one modem and LAN adapter. The Ethernet+Modem card comes with a single dongle with 10BaseT and phone line connectors, and you can use your LAN and the V.32terbo modem simultaneously. The Ethernet+Modem card comes with Novell, NDIS, and packet drivers, a modem communications program, and a very nice installation utility that makes getting up and running quick and easy. The Ethernet+Modem's 19.2Kbps V.32terbo modem is compatible with other V.32terbo modems, as well as with industry standard modems that run at speeds of 14.4Kbps and less.

The Ethernet+Modem card is the perfect card for laptops with just one PCMCIA slot. Currently Xircom is only shipping units for 10BaseT LANs, but later this year (perhaps by the time you read this) they should be shipping Ethernet+Modems for 10Base2/Coax networks, too.

Of the adapters I've tried, these three were the only units that worked in all three laptops I tested with, had locking connectors, and worked properly with my Novell and Lantastic networks. All of them are good, solid performers, and good choices for your LAN connectivity needs. ■

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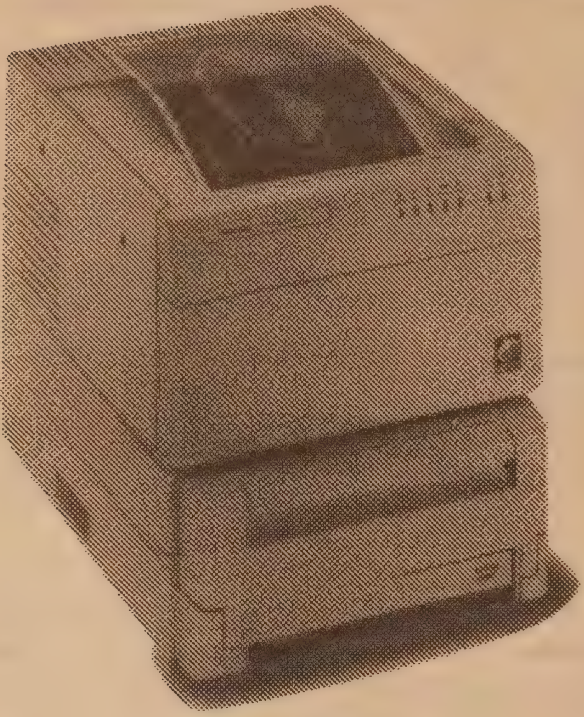
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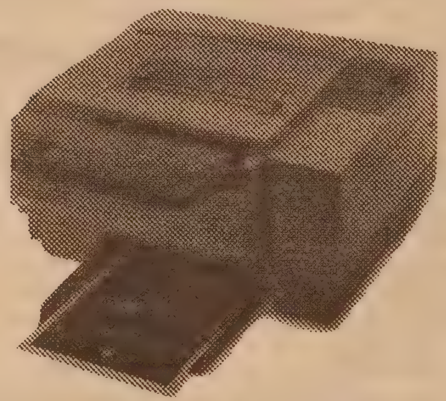

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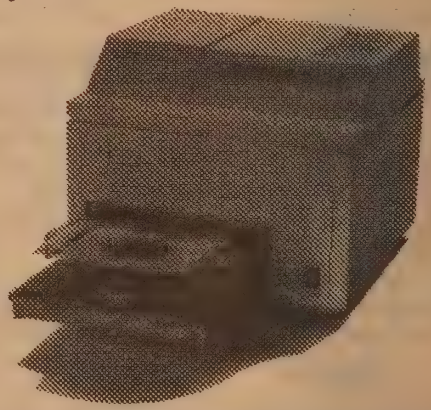

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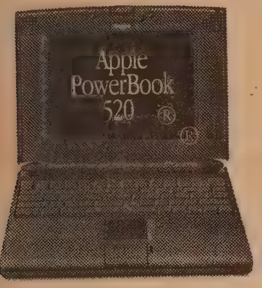

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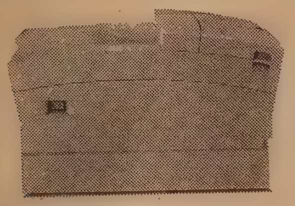

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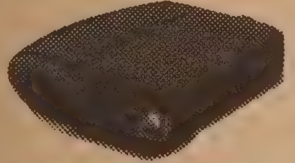

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BY ROBERT MOSKOWITZ

Telecommuting—A Growing Part Of The Job Market

The Number Of Companies Allowing Telecommuting As Well As The Total Number Of People In Each Company Involved Continues To Grow

The problem first appeared in 1986, when a group of data processing clerks took their employer to court because of their treatment after they followed directions and began working from home. As the case wound its way through the courts, the employees successfully proved their employer had indeed taken away their benefits. What's more, they were expected to meet higher production quotas than employees working at the office. After more than a year of legal wrangling, the group received in excess of $1 million.

Since then, telecommuters have become a lot more commonplace around (or more precisely, *not* around) thousands of offices, and at each stage of telecommuting's growth in popularity, telecommuters' rights as employees have become much more clearly defined.

One important change is that, rather than insisting on higher productivity from telecommuters, employers are now recognizing that it nearly always comes with the territory. Productivity increases among telecommuters have been documented at 10 to 20% over levels established while working every day in the office. Today, in fact, only about one employer in twenty-five continues to feel that telecommuters would be more productive if they came into the office more often.

Across the nation, there are dozens of legislative initiatives, bills proposed and pending, and even pieces of signed legislation that not only tend to create a body of law defining telecommuter rights and responsibilities, but that tend to encourage it. In Illinois, for example, a recent law requires some fifty-five hundred large employers to develop alternatives to traditional commuting by the end of this summer—and telecommuting is among the possibilities many consider quite likely to be offered.

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Many environmentalists have climbed on the telecommuting bandwagon, too. They consider telecommuting to be a powerful approach to preventing automobile pollution and traffic congestion. In fact, many people who have recently discovered telecommuting, including executives in charge of it at various organizations, and others in charge of selling products to practitioners of telecommuting at their customer organizations, seem to accept environment and traffic concerns as the major talking points behind the move toward telecommuting.

But among telecommuters and employers who favor and promote getting to work electronically, the most popular arguments for converting employees to the telecommuting styles appears to be lower turnover and higher retention of desirable and proven employees. "Without telecommuting," says one human resource manager, "we couldn't hold onto our best people."

According to surveys done by the American Telecommuting Association and others, the percentage of business organizations that support telecommuting among their employees has increased from 7 or 8% in the late 1980s to between 18 and 20% percent in 1993. What's more, the total number of telecommuters has increased from about two million to nearly eight million, over the same period.

One interesting aspect of this change in employment trends is that among major organizations a very much larger percentage are openly embracing telecommuting—as many as 40 or 45% by some counts—compared with the equivalent percentage among employers of all sizes. What's more, as few as one in five of the largest one thousand employers have still not begun to consider telecommuting as a viable option.

With all the acceptance among the so-called "major employers," one might think they would have the lion's share of the telecommuting work force. But in point of fact, far more telecommuters are employees of smaller organizations. This is probably because there are hundreds of small employers for every large employer, and these small employers—which provide most of the jobs in our economy—have been converting to telecommuting for more years than the larger organizations.

This increase in telecommuting activity means not only that more companies are allowing it, but that more people in each company are actually doing it.

For example, IBM reportedly allows nearly a third of its employees to telecommute at least one day a week. AT&T has shifted whole divisions from office-bound to telecommuting status, and continues to do so. Meanwhile, employers of a broad range of "white collar" workers—insurance companies, accounting firms, law firms, various types of consultancies, publishing companies, stock brokerages, software developers, and many others—are including telecommuting in their strategic plans.

At one time, many industry-watchers conjectured that these employers were being forced into accepting telecommuting. But in the enlightened '90s, the truth is that employers are recognizing the scarcity of good employees—hard-working, loyal, resourceful, intelligent, and skilled—and are beginning to bend over backwards to keep these people on their teams. The result: employers are looking carefully at a

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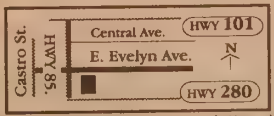

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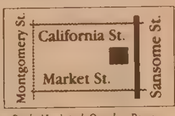

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whole range of flexible employment practices, of which telecommuting is a prominent part.

On Becoming A Telecommuter

I hear quite often from people who write to say they would like to be hired to be a telecommuter. It's a nice idea, but I generally feel forced to suggest they forget it. There's no real possibility of finding such a position. In my experience, an employer is far more likely to convert existing, proven employees into telecommuters than to hire totally new people and let them begin work somewhere outside the office. What's more, telecommuting is not a difficult or stand-alone "skill" that requires special talent. My guess is that no employer is hiring specifically for telecommuting experience. The reason: It's almost certain that a proven employee can learn to telecommute; it's far less certain that a proven telecommuter can learn to do a particular job or handle a specific responsibility within a company.

Fortunately, millions of people are already qualified to do work that makes sense to be done via telecommuting. Thousands of common jobs are very well suited to telecommuting. In fact, I've compiled a partial list of job titles that have been successfully filled by people while telecommuting at least some of the time:

- Accountant
- Actuary
- Administrator
- Advertising executive
- Agent
- Analyst
- Appraiser
- Architect
- Auditor
- Banker
- Bookkeeper
- Broker
- Chief executive officer
- Clerk/clerk-typist
- College professor
- Commercial artist
- Communications specialist
- Computer programmer (and other specialties)
- Consultant
- Contract manager
- Data entry/search specialist
- Department supervisor
- Designer
- Economist
- Editor
- Employment counselor
- Engineer
- Estimator
- Financial counselor
- Graphic artist
- Interior decorator
- Interviewer
- Journalist
- Lawyer
- Loan officer
- Manager
- Marketing consultant
- Order taker
- Paralegal
- Professor/teacher
- Public relations professional
- Purchaser
- Realtor
- Reporter
- Researcher
- Salesperson
- Social worker
- Statistician
- Surveyor
- Telemarketer
- Telephone operator
- Trader (stocks, bonds, commodities)
- Training specialist
- Translator
- Travel agent
- Underwriter
- Word processor
- Writer

Regardless of whether or not your job title is listed here, a great many tasks that are part of many thousands of different jobs are perfectly appropriate to be done while telecommuting. Here is a partial listing:

Mental Tasks You Can Do While Telecommuting

- Analyzing
- Auditing
- Comparing/contrasting
- Creating
- Modifying
- Planning
- Problem solving
- Thinking
- Visualizing

Manual Tasks You Can Do While Telecommuting

- Computer work
- Contract preparation/analysis
- Correspondence
- Data entry/correction/manipulation
- Designing
- Filling in/processing forms
- Meeting via telephone or other medium
- Numerical/financial calculations
- Project analysis/management
- Reading/studying
- Record keeping
- Researching/fact checking
- Sales/contact
- Telephone answering/customer service
- Writing/typing

But just having the right job title, or the right mental or manual tasks as components of your job, is not enough to qualify you for telecommuting. The critical factor in becoming a telecommuter is often whether or not you have demonstrated to your present management your ability to work independently.

Reading between the lines, you can probably recognize that this consideration actually translates into whether or not your supervisor feels you will work as hard as a telecommuter—where he or she is not watching you constantly—as you now work at the office.

"Management by results" is the standard policy to suggest to supervisors worried about lazy employees shifting to telecommuting status, then getting paid to sleep late or lounge in front of the TV. But you may not even get to the point of suggesting this approach if you haven't proven yourself thoroughly in the past.

One good way to "ease into" telecommuting with a reluctant boss is to start one day at a time. Pick a day or a week when the rush is really on. Then ask if you can't work at home—or elsewhere out of the office—one day "so you can really get some work done." Make sure everyone knows how much you accomplished this way. Next month, find another good day for telecommuting. After a few of these successful forays beyond the office pale, you may be in a position to suggest working this way on a more regular basis.

Top Telecommuting Employers

Recent surveys seem to indicate that the following companies, if not the best employers for people who want to telecommute, are certainly high in the ratings.

Pacific Bell
140 New Montgomery St.
San Francisco, CA 94105
Telecommuting Positions: engineer, computer programmer, product analyst, market forecaster, market planner

California State Department of General Services
601 Sequoia Pacific Blvd.
Sacramento, CA 95814
Telecommuting Positions: attorney, actuary, various clerical staff

Apple Computer, Inc.

20525 Mariani Ave.
Cupertino, CA 95014
Telecommuting Positions: technical writers, strategic planners, computer programmers, product managers

County of Los Angeles
222 N. Grand, Room 585
Los Angeles, CA 90012
(Previously written up in this space)
Telecommuting Positions: probation officer, analyst, planner, typist

AT&T
550 Madison Ave.
New York, NY 10022
Telecommuting Positions: sales representative, project manager, public relations manager, telemarketing representative, attorney

General Electric—Plastics Division
214 7th St., Suite 401
Parkersburg, WV 26102
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The US Government
Office of Personnel Management
1900 E St., OPRD Room 6462
Washington, DC 20415
Telecommuting Positions: expanding rapidly, virtually all office positions are eligible for classification as a telecommuter

US West, Inc.
7800 East Orchard Rd.
Englewood, CO 80111
Telecommuting Positions: manager, computer analyst, computer programmer, records manager

Travelers Corp.
One Tower Sq.
Hartford, CT 06183
Telecommuting Positions: researcher, claims processor, manager, computer programmer, actuary

JCPenney
100 N. Corporate Dr.
Brookfield, WI 53005
Telecommuting Positions: customer service representative

But don't expect to be hired to telecommute. As I have indicated, you're more likely to gain telecommuter status after you've established yourself with your employer. These companies are simply more open to allowing telecommuting than some other employers.

Problems With The Data Superhighway

Now that the White House is embracing the concept of the data superhighway, a great many telecommuting experts and advocates are foretelling the dawn of the great age of telework.

But there may be some problems en route to this heaven on earth. For example, many people feel that the average worker who becomes a telecommuter will not be able to earn a decent living very long. As the data superhighway speeds up the process and brings down the cost of sending information around the globe, employers sending out the typical data packet will be more and more likely to seek out and find the cheapest laborer to process it. High-living yuppies in Aspen and Big Sur will be underbid by Indonesian, Indian, and

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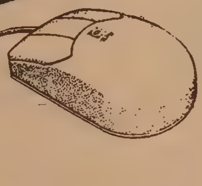

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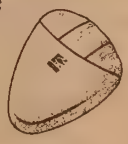

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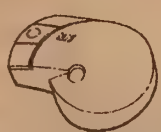

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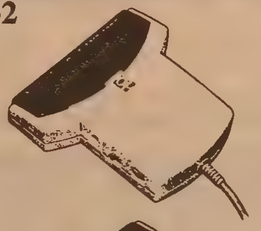

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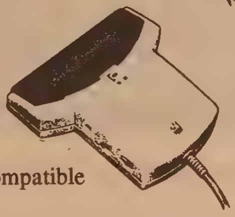

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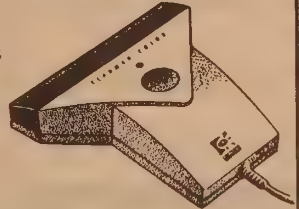

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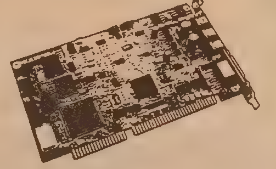

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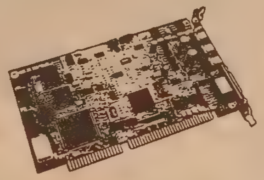

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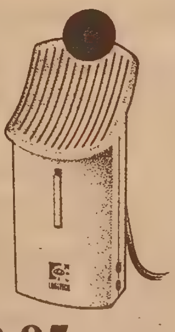

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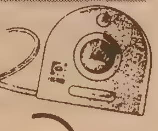

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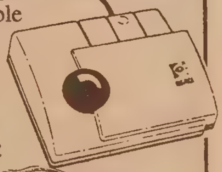

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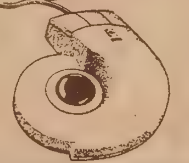

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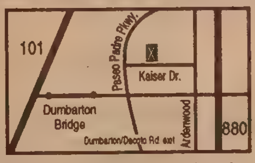

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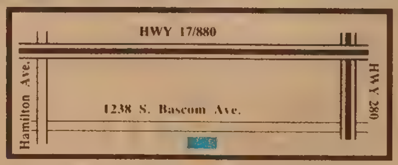

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Telecomuting *continued....*

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There is more than one telecommuting analyst with a great fear that today's middle class American will be forced into competition with tomorrow's information piece-worker and that—as a result—wages and benefits will inevitably be harmonized downward.

The percentage of business organizations that support telecommuting among their employees has increased from 7 or 8% in the late 1980s to between 18 and 20% in 1993.

Speaking more psychologically and metaphorically, many critics of the information superhighway see it as a step toward virtual reality—which is another way of describing a step away from actual reality. They foresee a world in which more and more people are more and more isolated in their air-conditioned telematic workstations. They are isolated not only from flesh-and-blood contact with other people, but from contact with the planet itself. There is the potential not only for rampant disease as we lose our resistance to the planet's germs, but for individual and mass insanity as we lose contact with the boundaries of day-to-day life.

Critics also argue that a mass shift from our present styles of work to a telecommuting-intensive mode will create pressures for change on our political systems. But who can say which direction these pressures will force us?

Perhaps a global government will emerge, and that could certainly be a good thing. But to the extent local interests, culture, and values are submerged in the global hierarchy, much that is of value could be lost. What's more, the economic and political incentives associated with providing technology and other development to Third World nations—necessary to feeding and expanding the telecommuting mode of operation—could prove strong enough to overcome other concerns, such as self-determination, peace, even democracy itself.

Going another step, it's possible to envision that as communications technology supplants our present-day modes of social interaction—visiting, talking face to face, and so forth—it's likely to foment changes in the human race. We have already evolved from hunter-gatherers to toolmakers, from tribal nomads to city dwellers. If those who would be more successful in this brave new world are not the same ones as will be successful in our present society, how might their differences impact our immediate future or the future evolution of the human race?

Clearly, these questions are not going to be answered quickly. But the dialog has been opened. Anyone with ideas or information to contribute to this discussion is welcome to write me or email me, and in turn I'll keep you posted on important developments in this area. ■

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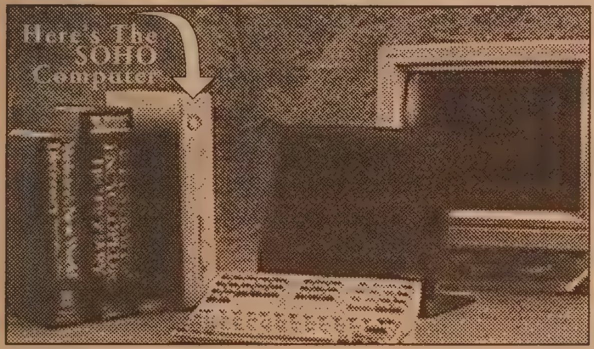

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BY DAVID SIMON, CPA, AND JENNIFER R. CHERNISS

Latest Word On Home Computer Deductions

Strategies And Laws To Consider When Purchasing Or Accounting For Business-Related Computer Equipment

The increasing use of home computers for income-producing purposes has been accompanied by evolving IRS positions regarding tax deductions of their costs. This article provides an outline of current tax strategies, requirements, flexibilities, and loopholes to keep in mind when purchasing or accounting for computer equipment and related expenses. It updates information shared in this space a year ago.

Computers and peripheral equipment are often designated by the IRS as "listed property," i.e., property lending itself to personal, nondeductible use, but which is likely to be claimed as a business expense. Examples of other listed property are cars and cellular telephones; software is not included in this definition. Listed property is subject to special, restrictive rules for tax deductions.

Whether or not a computer is considered listed property depends on how and where the computer is used. If your computer is tagged as listed property, the effect of this depends upon your particular tax situation. It may not matter a bit, or the rules may result in the loss of most or all of your tax benefits.

Important tax opportunities may be available if you anticipate and take into account the effect of the listed property rules at the time you make your computer purchase.

What's An Office?

According to temporary IRS regulations, you needn't worry about computer equipment if it is used exclusively at your regular business establishment and owned or leased by the person operating that establishment. Such equipment is deductible by the owner in the year purchased, up to certain limits as explained later in this article. An office in the home can qualify as a regular business establishment for this purpose—if that office is found to be legitimate by current IRS definitions. Of course, an employee using a company-owned computer gets no deduction anyway.

For your office at home to qualify as such for tax purposes, certain conditions must be met. The home office must be used exclusively, on a regular basis, as a) the principal place of business you conduct, or b) a place of business used by clients or customers when meeting with you in the normal course of business.

For employees using their own computers at home, there are two additional requirements for the home office to qualify. The office must be 1) for the convenience of the employer, and 2) required as a condition of employment. The employee's computer, even if used exclusively for the employer's work, is listed property if the home workspace doesn't meet these "office-at-home" requirements.

Determining if your home office qualifies can be even more complicated than that. Numerous exceptions and requirements exist in regulations and case law, so you may need to get professional advice or hit the tax journals to evaluate your specific situation. A good article analyzing office-in-the-home requirements is "Home Office Deductions Restricted by Supreme Court," *Taxation for Accountants* (April, 1993). For a courtesy reprint from my office (with permission of publishers Warren Gorham Lamont), call (510)893-5753.

Tax Benefits For Computer Expenses

Computer hardware and peripherals used in a regular business are generally eligible for a highly favorable expense election under which up to $17,500 of the cost of property is deductible in the year the property is placed into service. The remainder of the computer's cost can be written off over five years, using an accelerated depreciation method.

> If **software costs** are included in the cost of the computer hardware, without the **purchase price** being separately stated, the software costs are treated as a part of the cost of the hardware.

This $17,500 is the maximum available to any taxpayer, including a corporation (although not all taxpayers are entitled to this benefit). The limit is applied to each partner in a partnership, as well as to the partnership itself.

Suppose you purchase $12,000 worth of computer equipment one year. And suppose you are also a partner in a partnership that purchased industrial machinery, your share of which is $10,000. Because the partnership already used $10,000 of your $17,500 allowance, you can currently deduct only $7,500 of your $12,000 purchase. The remaining $4,500 can still be depreciated with an accelerated method.

Neither the $17,500 expense election nor accelerated depreciation is available if the computer is listed property, and if business use of the listed property is 50% or less of its total usage in the first year. Instead, any allowable deductions would be limited to the much slower, straight-line depreciation method, where the cost is deducted in equal amounts over five years.

Even if business use increases to more than 50% in a later year, you can't switch to an accelerated method. What's more, if the computer is listed property meeting the more-than-50% test in the year you placed it in service, but fails to meet the test in a later year, then the accelerated deductions are subject to "recapture"—meaning that you have to give some of those tax benefits back to Uncle Sam.

Let's say a company requires its sales team to use portable computers in addition to the desktop computers provided at headquarters. The company purchases three laptops, one for each salesperson,

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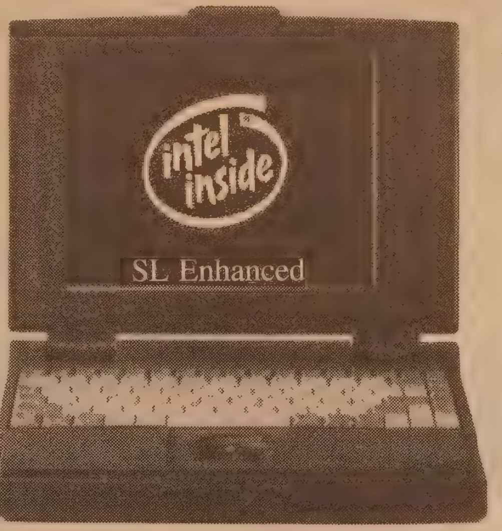

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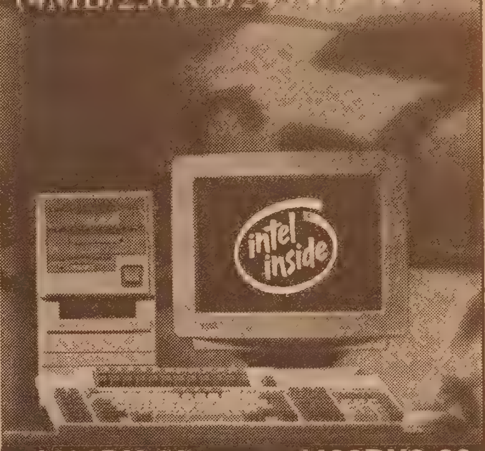

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intended to be used primarily for business purpose. The salespeople are permitted, however, to make personal use of the laptops if such use in no way interferes with their duties. During the first year, the laptops are used as follows:

Laptop User	Business Use	Personal Use
Salesperson A	100%	0%
Salesperson B	80%	20%
Salesperson C	50%	50%

The laptop used by A qualifies for the expense election and rapid depreciation, but only 80% of the cost of B's qualifies. C's computer expense qualifies only for five-year straight-line depreciation, even if in later years it is used entirely for business.

Suppose that, instead of the employer providing these laptops, A buys a desktop to do work at home in the evenings and on weekends. The computer is employed exclusively in connection with work, and A uses the computer to stay competitive. Furthermore, a room in A's home is dedicated as a home office. Unfortunately, not only is the computer listed property, but it can't be deducted at all.

The computer is listed property because A's home office doesn't qualify as an IRS-recognized office-at-home. The employer has all of the office space and equipment needed to do the work at the employer's place of business. Even though the employer would benefit by having the sales force work overtime, it would be just as convenient for the company if they worked after hours at the facility. The job doesn't require off-site work, even if the employee benefits from it.

The tax law provides no special limits on the depreciation deduction, nor on the expense election, for listed property for tax years in which the property is used more than 50% for business. Rather, in the case of listed property, the law merely redefines "business use."

The company in the above example supplies computers needed for the job. The fact that a home computer enables

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-Typing Teacher
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-Music Software Bundle
-Stereo Amplified Speakers
-CD Pack Bundles w/6 Titles
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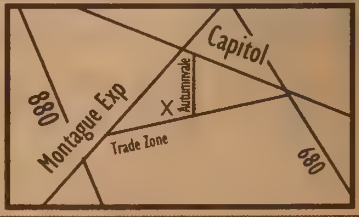

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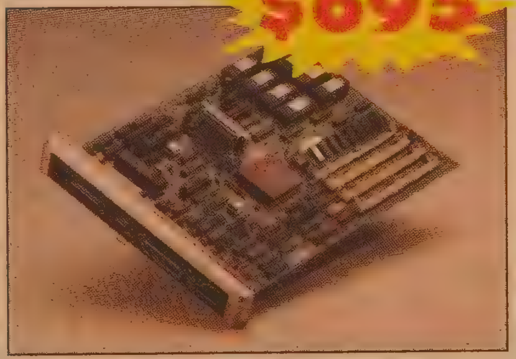

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the sales force to more easily and efficiently perform the duties of employment does not mean that its use is required as a condition of employment. Since the employee can't prove that the home computer would be for the convenience of the employer and is required as a condition of employment, no depreciation or any other business deduction is permitted.

Moreover, there's no statutory definition of "convenience of employer." Whether or not the computer is furnished for the convenience of the employer depends on all the facts and circumstances. However, "there must be a clear showing that the employee cannot perform properly the duties of employment without it."

Tax Planning

From a planning perspective, you should ask your employer, or prospective employer, for a written statement that you are required to provide your own computer in order to perform your assignments. While a letter from the boss may be helpful, however, IRS regulations state that an employer's mere assertion that the use of the property is a condition of employment is insufficient proof.

Other factors the IRS considers are if the computer is needed at isolated or remote job sites, and if your job duties require you to be available on 24-hour call or to work weekends. If the office is inaccessible at night and you can't be expected to finish all your work without taking it home, that may suggest that the computer is used for the convenience of the employer.

The IRS has issued guidance as to how to structure an employment contract so that an employee's home computer will pass the business use tests, even if it is listed property. Please feel free to call my office for a copy of Rev. Rul. 86-129, 1986-2 C.B. 48.

Other Ways To Benefit

The cost of a home computer not used in a trade or business may otherwise be depreciable if the equipment is used for production of income or for investment purposes. Examples include managing an investment portfolio or figuring your taxes. Listed property rules will apply, however, so costs can only be recovered by claiming straight-line depreciation, reported as a miscellaneous itemized deduction on Form 1040, Schedule A.

What about computers used for more than one purpose; e.g., partly for qualified business use, partly for investment tracking, and partly for personal activities? Unless your qualified business use is more than 50%, the listed property rules apply to both the business and investment uses. If you meet the 50% test, you need to allocate the cost of the computer among the separate uses. This allocation is based on the number of hours the computer is used for each purpose. Deductions can never be taken for that portion allocated to purely personal use.

Suppose you use a home computer 60% of the time to manage your investments, 30% of the time for your part-time cosmetics dealership, and 10% of the time for purely personal matters. Because your business use is less than 50%—even

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486DXII-66 INTEL	299
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5104400-80/70 (1X4) DIPP	21/27
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PENTIUM P5-90/256K PCI INTEL	1299
PENTIUM P5-90/256K VLB	1239
PENTIUM P5-66/256K PCI	999
PENTIUM P5-60/256K VLB	899
PENTIUM P5-66/512K VLB	939
PENTIUM P5-60/512K VLB	863
486DX4-100/256K VLB	719
486DX2-66/256K PCI+VLB	499
486DX-33/256K PCI+VLB	389
486DX2-66/128K ISA/VLB	410
486DX-50/128K ISA/VLB	429
486DX-33/128K ISA/VLB	309

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64X4-25/15	6.75/9.75
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BLUE LIGHTNING 75MHZ	520	626	787	1006	1240
486DX2-66 PCI 256K	555	662	823	1042	1275
486DX2-66 VLB 256K	438	545	705	925	1158
486SLC-66 VLB 64K	246	353	513	733	966
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486DX-40 VLB 256K	322	428	589	809	1042
486DX2-50 VLB 256K	383	488	649	868	1102
486SLC-50 VLB 64K	220	326	487	707	940
486SLC-50 ISA	170	276	437	657	840
486DX2-50 PCI 256K	476	583	743	963	1196
486DLC-40 ISA 128K	137	243	404	623	857
486DX-33 PCI 256K	471	578	739	958	1191
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230W PS	38
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DTC 2290 DISA IDE	118
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ViewSonic 15E NI .28	410
17" ADI 28 NI 1280x1024	740
NEC 5FGE/4FGE	1059/735
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486DX-66/50/33/256K 2 VLB	95
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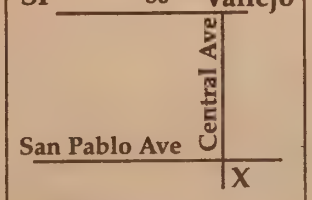

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though 90% of the use is for income generating purposes—you can't use accelerated depreciation, nor can you elect to currently expense any of the costs. Instead, 90% of the costs are depreciable over five years, and only with the less favorable straight-line method.

Claiming Your Deductions

The cost of the computer is reported on Form 4562, Depreciation and Amortization. If the computer is listed property it is separately reported on Form 4562 in Part V.

As an employee, once you determine that you can depreciate or expense the cost of your own computer, you will also report the deduction on Form 1040 Schedule A, as a miscellaneous itemized deduction. Miscellaneous itemized deductions are allowed only to the extent that their total exceeds 2% of your adjusted gross income for the year.

The 2% floor applies every year that you claim depreciation. But if the computer is not listed property that fails the more-than-50% test, you can usually elect to expense the entire cost, up to $17,500, making the 2% floor apply only once. This creates a strong incentive to meet the office-at-home and convenience-of-employer tests.

The 2% floor is of little consequence to those taxpayers whose total miscellaneous itemized deductions exceed this amount. For many, however, little or no tax benefit remains after the 2% floor is applied.

Software Deductions

The cost of software is usually handled differently than that of hardware, because software is treated as a license right rather than as tangible property. Depreciation of packaged software "shall be computed by using the straight-line method and a useful life of 36 months." Because software is intangible, it doesn't qualify for that up-to-$17,500 expense election in the first year of service.

Three years may seem like a long life for off-the-shelf software (including updates), but that's what Congress mandated as part of the 1993 Tax Act.

Under an exception, however, if software costs are included in the cost of the computer hardware, without the purchase price being separately stated, the software costs are treated as a part of the cost of the hardware. This is the case with "bundled" software, where the bill for the computer system does not itemize amounts for the software and hardware.

This provides some tax planning opportunities when the salesperson writes up the ticket. If the computer is not listed property, you may be able to take greater advantage of the $17,500 election by including the software costs as part of the hardware. ■

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Internal Revenue Code of 1986 as amended, Section 280F and regulations thereunder and Code Section 167(f)
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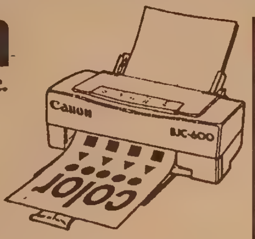

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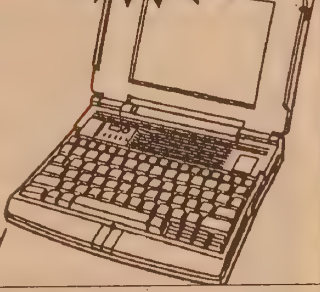

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OS/2: Adding Printers

Tips For Installing A New Printer Or Updating The Driver On An Older One

Color printing is a natural for OS/2. The technology is constantly improving. There are a few inexpensive printers available with quite decent output (e.g. Star SJ-144, Canon BJC-600, HP DeskJet 5XXC), and better ones are arriving (the recent Nikon NP-10 CoolPrint at $2000 list looks interesting). Unfortunately, OS/2 drivers remain a problem, particularly for the new, and thus better, color models.

In DOS, printer support was application based; every application had to provide its own set of drivers for every printer its developer wanted to support. Usually it was impossible to switch printers from within applications.

OS/2 eliminated application-based printer support. If a printer's manufacturer provides an OS/2 driver, it serves all applications. All developers have to do is to provide, within their applications, the capability for the user to select any printer at any time.

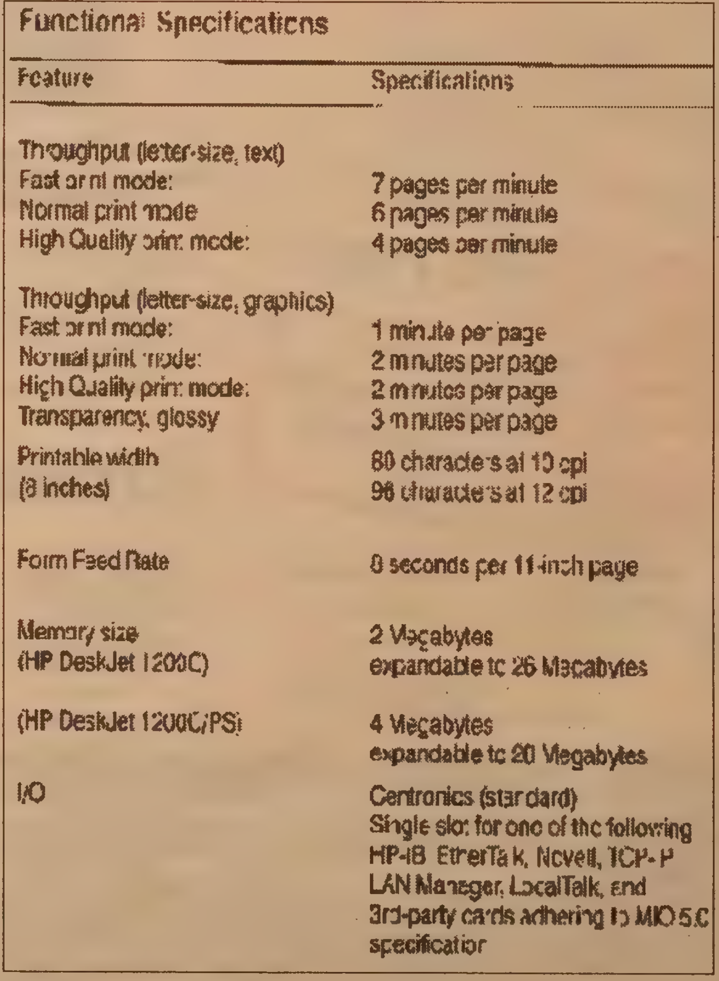
This shifts the responsibility of developing OS/2 drivers to printer manufacturers; for a variety of reasons, they have not been eager to do so. While IBM developed OS/2 drivers for a considerable number of printers—particularly the most popular ones—practically all new printers come without OS/2 drivers. Of the available drivers, many do not take full advantage of the specific printer's capabilities (some can only be used in some emulation mode, e.g. LaserJet or Epson), or give the user very limited control over them. And support can become problematic when there are two vendors involved.

One of the more mature color printers, Hewlett-Packard's DeskJet 1200C printer (see Figure 1), even though not exactly cheap, does have OS/2 drivers, so I asked HP for one to review in this column.

> You should create a separate printer object for each printer you install in you system, regardless of what driver supports it.

Printers, Drivers, And Objects

It is important to understand that a printer and a printer driver are not the same thing. A driver is a program (and possibly data) that usually supports multiple printer models with similar, but not necessarily identical capabilities (e.g. LaserJet or Epson compatibles). Even though the driver's "engine" is the same for all the printers it supports, the user interface to the engine is likely to vary, even if slightly, by printer model. In the course of installing any driver, you'll get a list of printer models from which to choose the one you want.



Functional Specifications

Feature	Specifications
Throughput (letter-size, text)	
Fast print mode:	7 pages per minute
Normal print mode	6 pages per minute
High Quality print mode:	4 pages per minute
Throughput (letter-size, graphics)	
Fast print mode:	1 minute per page
Normal print mode:	2 minutes per page
High Quality print mode:	2 minutes per page
Transparency, glossy	3 minutes per page
Printable width (8 inches)	80 characters at 10 cpi 96 characters at 12 cpi
Form Feed Rate	8 seconds per 11-inch page
Memory size (HP DeskJet 1200C)	2 Megabytes expandable to 26 Megabytes
(HP DeskJet 1200C/PS)	4 Megabytes expandable to 20 Megabytes
I/O	Centronics (standard) Single slot for one of the following HP-IB, EtherTalk, Novell, TCP-IP LAN Manager, LocalTalk, and 3rd-party cards adhering to MIO 5.0 specification

FIGURE 1

The printer-specific interface to a driver is contained in the printer object you create for the printer. You should create a separate printer object for each printer you install in your system, regardless of what driver supports it. It is possible to create one printer object for all printers on the system, but it is not recommended; it is more intuitive to conceive of a printer object as a printer, and OS/2 makes it easier to switch printers (see below).

In my case, for example, I have a Kyocera FS-1500A Ecosys printer. Prior to v2.1 OS/2 came with a LaserJet series driver (LASERJET.DRV) that supported many LJIII compatibles, but not the 1500 directly. Therefore, whenever there was an upgrade of the driver, I would select LJIII as the printer model at installation time. This would give me an LJIII user interface to the driver. The Kyocera does a good job of emulating the LJIII, but I was not getting some of its specific enhancements (e.g. additional fonts, duplex printing). OS/2 2.1 came with a LaserJet driver (v1.3.410) which for the first time supported the Kyocera 1500 directly, thus providing a user interface slightly more specific to it.

Like many printers, the HP DeskJet 1200C comes in regular and PostScript (PS) versions; HP sent me a PS unit (I will discuss the difference next month, when I report on the 1200C results under OS/2). An OS/2 driver (PSCRIPT.DRV) supporting

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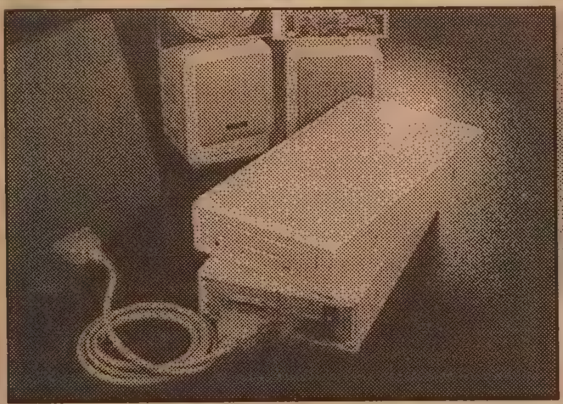

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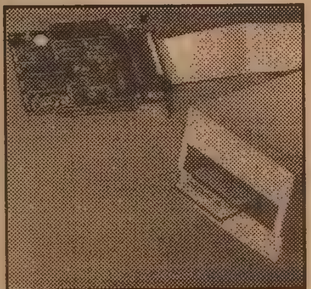

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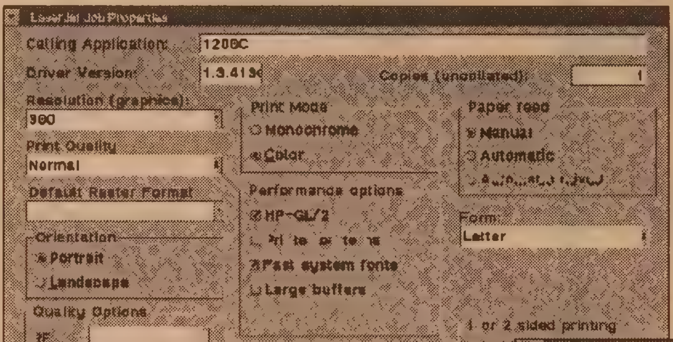
many PostScript printers has been available for quite a while, and since 2.1 it has also provided a user interface specific to the 1200C/PS (the OS/2 ServicePak discussed last month contains the same driver). Recently IBM released a (beta) upgrade of the OS/2 LaserJet driver (v1.3.413C) which adds support for the HP LJIV series and, as it turns out, for the base, non-PS 1200C as well.

There are two OS/2 drivers that support the 1200C: the PostScript driver supports the PS mode, and the LaserJet driver supports the base, non-PS mode. My Kyocera 1500 printer is also supported by the same LaserJet driver that supports the base 1200C, so upgrading the driver adds 1200C support and upgrades the Kyocera support!

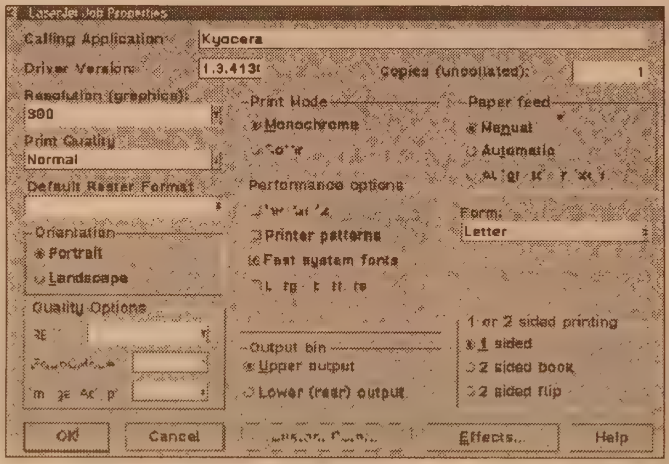
Thus, moving from one driver (the old LaserJet) supporting one printer (the Kyocera) to two drivers (the PS and the new LaserJet) supporting three printers (the 1200C/PS, and the Kyocera and the 1200C, respectively) involves adding one driver and replacing another, a rather tricky distinction in OS/2 as it turns out.

(Finding/getting the latest driver that supports your specific printer, particularly if it is not included in OS/2 or its SPs, is not always easy. It took several calls to IBM OS/2 support and overcoming some incorrect responses to get to the bottom of this. As stated above, the PostScript driver came with OS/2 2.1, but the LaserJet driver upgrade, which was released after the ServicePak, can be downloaded from either CompuServe OS/2 or HP forums, or from the IBM BBS. Drivers not included in OS/2 or its SPs must be preprocessed before they can be installed; this is rather straightforward, and you end up with a diskette ready to be used by the installation process.)

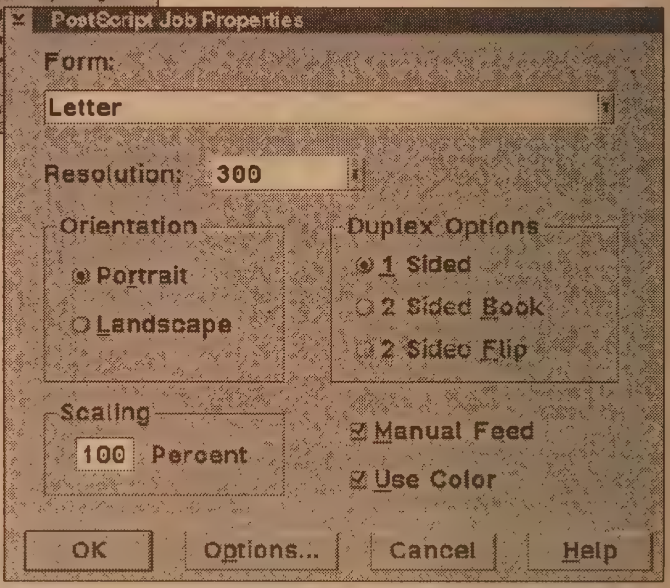

LaserJet Job Properties
Calling Application:
Driver Version:
Copies (uncollated):
Resolution (graphics):
Print Quality
Default Raster Format
Print Mode
Paper feed
Performance options
Form:
Orientation
Quality Options
1 or 2 sided printing
OK
Cancel
Custom Color...
Effects

Calling Application: 1200C
Driver Version: 1.3.413C
Copies (uncollated): 1
Resolution (graphics): 300
Print Quality: Normal
Print Mode: ○ Monochrome ● Color
Paper feed: ● Manual ○ Automatic
Performance options: ☒ HP-GL/2 ☒ Fast system fonts ☐ Large buffers
Form: Letter
Orientation: ● Portrait ○ Landscape

FIGURE 2A ▲ **FIGURE 2B ▼**


LaserJet Job Properties
Calling Application
Driver Version:
Copies (uncollated):
Resolution (graphics):
Print Quality
Default Raster Format
Print Mode
Paper feed
Performance options
Form:
Orientation
Quality Options
Output bin
1 or 2 sided printing
OK
Cancel
Effects...
Help

Calling Application: Kyocera
Driver Version: 1.3.413C
Copies (uncollated): 1
Resolution (graphics): 300
Print Quality: Normal
Print Mode: ● Monochrome
Paper feed: ● Manual ○ Automatic
Performance options: ☐ Printer patterns ☒ Fast system fonts
Form: Letter
Orientation: ● Portrait ○ Landscape
Output bin: ● Upper output ○ Lower (rear) output
1 or 2 sided printing: ● 1 sided ○ 2 sided book ○ 2 sided flip


PostScript Job Properties
Form:
Resolution:
Orientation
Duplex Options
Scaling
Percent
OK
Options...
Cancel
Help

Form: Letter
Resolution: 300
Orientation: ● Portrait ○ Landscape
Duplex Options: ● 1 Sided ○ 2 Sided Book ○ 2 Sided Flip
Scaling: 100 Percent
☒ Manual Feed
☒ Use Color

FIGURE 3 ▲

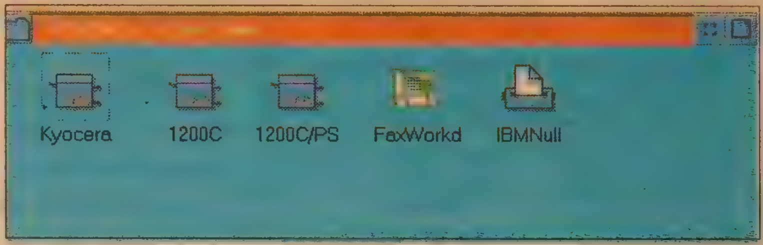
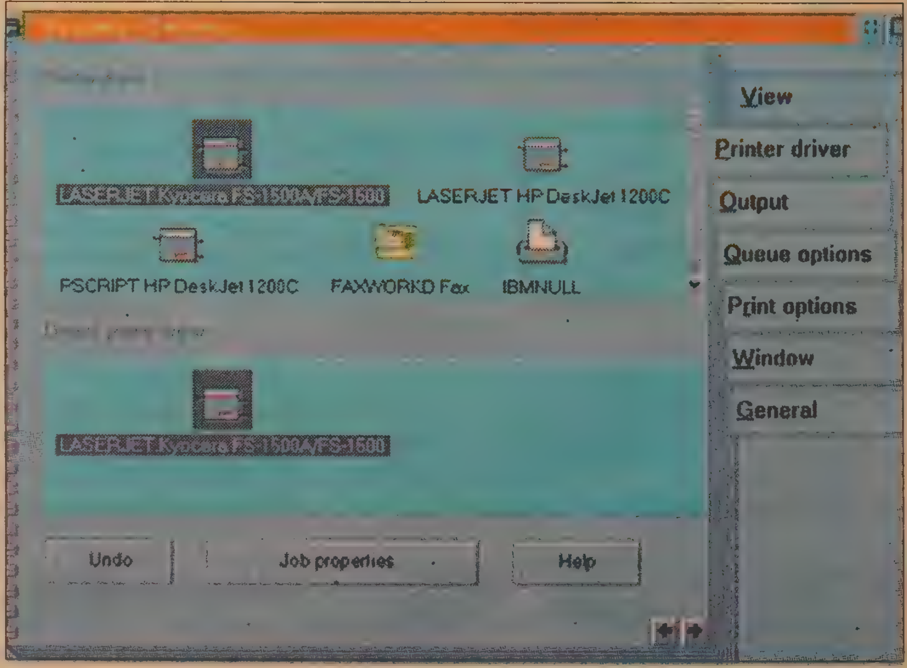

Kyocera
1200C
1200C/PS
FaxWorkd
IBMNull

FIGURE 4A ▲ **FIGURE 4B ▼**


LASERJET Kyocera FS-1500A/FS-1500
LASERJET HP DeskJet 1200C
PSCRIPT HP DeskJet 1200C
FAXWORKD Fax
IBMNULL
LASERJET Kyocera FS-1500A/FS-1500
View
Printer driver
Output
Queue options
Print options
Window
General
Undo
Job properties
Help

Adding A New Printer; Upgrading An Existing Driver

My Kyocera printer object resides in a Printers folder I created. To create a new object for the base 1200C printer, I dragged a Printer template from the Templates folder to the Printers folder. OS/2 opened a window which listed the drivers already installed on the system (in this case, the old LaserJet for the Kyocera) and asked me if I wanted one of them to support the new printer, or to install a new one. Since I had an upgrade, I opted for the latter, and the driver installation program kicked in.

The program (also accessible from OS/2 Selective Install) assumes that the driver came with your installed version of OS/2 and displays a scrollable list of all the printers supported by the installed drivers. But if the driver is on disk (OS/2 or its SPs, or, as in this case, downloaded from some distribution system) you select the "Other" option, insert the preprocessed driver disk, and click on the Refresh button. This brings a new list of the printers supported by the driver on the disk. Scrolling it you find and select the one you want (here the 1200C).

At this point OS/2 will discern whether the driver is an upgrade of an installed version and, if it is, will ask whether to overwrite the old driver. In this case I had an upgrade, so I said yes and OS/2 copied the driver files over the old ones, informed me of successful installation, and brought me back to the original window to press the Create button, which completes the process.

You can now go into the new object's Settings and configure it for your own needs. For example, if you go into the "Printer driver" setting and click on "Job Properties," you will access the user interface of the printer you selected to the driver you installed (in this case the base 1200C interface to the new LaserJet driver, Figure 2A). Here you can select the features you want from those that the driver supports for your specific printer (e.g. fonts, cartridges, input/output trays, etc.).

From this point on the new driver is available for all printers it supports (here, the 1200C and Kyocera), but with possibly

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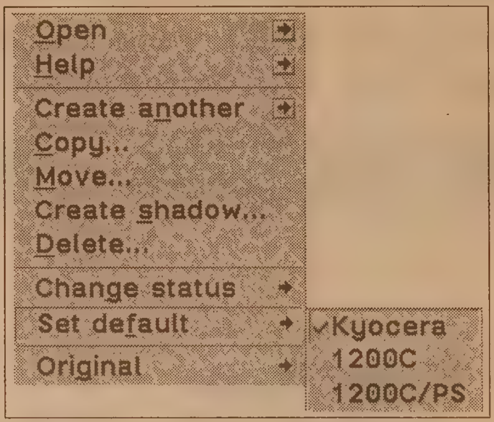

FIGURE 5 ▲

different configurations for each printer.

But the Kyocera's old printer object still had the interface to the old LaserJet driver, overwritten by the upgrade. To upgrade it I first deleted the existing Kyocera object, shut down, and rebooted the system. I then dragged a template to create a new printer object and followed the same steps described above for the 1200C, except that now I told OS/2 not to bother and overwrite the driver, I selected the Kyocera 1500 from the printer list, and I named the new object accordingly.

Figure 2B shows the new Kyocera object interface to the LaserJet driver installed for the 1200C. Comparing it to the 1200C one in Figure 2A you can see differences, for example the color features are greyed out for the Kyocera, but accessible for the 1200C.

Adding A New Printer And Driver

The procedure for adding a new printer supported by a new driver is similar, but simpler because you don't have to worry about the common driver issues.

Thus, to add the 1200C/PS printer, I created a new printer object and followed the same procedure as the one for the base 1200C above. Since the PS driver was new, OS/2 does not prompt for overwrite, it simply copies the driver files to the hard disk. Figure 3 shows the 1200C/PS interface to the PS driver, which is quite different than those of the Kyocera and base 1200C to the LaserJet driver shown in Figure 2.

Figure 4A shows my Printers folder after the installation and Figure 4B shows all the installed drivers. Their name is a combination of the driver name and the name of the printer for which the driver was installed.

Note: The IBMNULL driver is installed by OS/2 and the FaxWorkD is a quasi-printer driver installed by PMFax that allows you to "print-to-fax" directly from an OS/2 application.

Printer Ports

The serial port is an important issue—when you create a new printer object (and, thus, a printer) you must associate it with an available printer port. OS/2 provides three, LPT1, LPT2, and LPT3.

Make sure that they (or their standard IRQs/addresses) are not already in use (e.g. the FaxWorkD driver uses LPT3), and then associate each printer with one (in the "Output" setting of its object).

Printers attached to separate parallel ports can print simultaneously under OS/2. However, multiple printers cannot share one port. If you have more than two printers, you can associate multiple printers to one parallel port, but you cannot print simultaneously from both.

Switching Printers

Since the Kyocera is my default printer, it was shadowed on my desktop. I now shadowed the two new 1200C objects to the desktop, which enables me to switch default printers very easily. I can invoke any object's pop-up menu, select Set Status (Figure 5) and click on any of the printers I want to set as default. A similar list is available from OS/2 applications.

Stay tuned for a report next month of how the 1200C fares under OS/2. (Due to an error of omission in issue 123, the column on scanning with the HP ScanJet IIcx erroneously failed to list resources, so I am listing them this month. Sorry.) ■

RESOURCES:

DeskJet 1200C/PS
Hewlett-Packard
San Diego Printer Division
16399 W. Bernardo Dr.
San Diego, CA 92127-1899

OS/2 LaserJet Driver (v1.3.413C)
downloadable from CompuServe
or IBM BBS (914)517-0001

JUNE RESOURCES:

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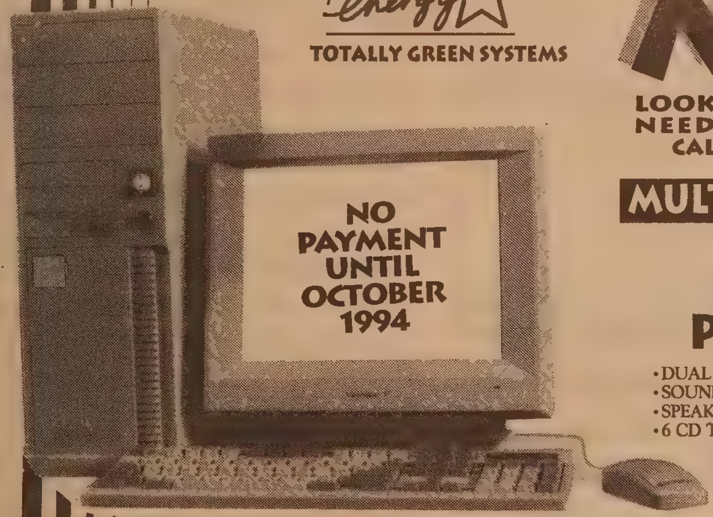

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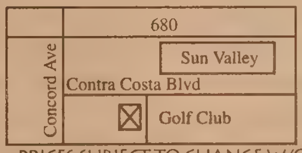

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UNIX • BY DAN B. LIEBERMAN

UNIX On Your Macintosh

MachTen Offers A Low-Cost Solution To Running On UNIX A Mac

UNIX is a true multitasking, multiuser operating system. Many systems offer the ability to "run programs in the background," but the efficiency of the program "running in the background" just goes down the drain. On the other hand, UNIX uses what are called preemptive threads to get its job done, and it does it well. Another bonus to UNIX is its advanced demand-paged virtual memory and memory protection features. UNIX is the operating system of choice for high-end workstations. Less well known is that this powerful operating system is available for your Macintosh. Are you interested now, but wary of losing the Mac's familiar and easy-to-use interface? MachTen, from Tenon Intersystems, offers a low-cost solution. MachTen is a full implementation of 4.3BSD Reno UNIX, running over Carnegie-Mellon's Mach 2.5 microkernel.

MachTen is easy to install and operate, yet the documentation included in the package is very limited, containing just a couple of printed manuals and the online manual pages. The full technical documentation is available, but is going to cost you another $300.

Tenon offers four MachTen packages—two for the higher-end customer, and two for the lower-end customer. At the lower end is Personal MachTen, which includes the full suite of TCP/IP networking tools, and all of the necessary C compiling and linking tools. In previous versions of MachTen that were shipped, the development system was sold separately, so including the development tools and libraries in the Personal Package was definitely a plus. There are two versions of the Personal Package: Workstation and Server. Both are multiuser systems, but the Server version supports up to eight I/O ports or network interfaces, rather than the Workstation's one.

For the higher-end customer, there is Professional MachTen. It includes all of the tools and libraries that are provided with Personal MachTen, as well as a source debugger, a C++ compiler, and Mach C Threads. Professional MachTen also supports Virtual and Protected memory for UNIX processes. The Workstation and Server options are the same in Professional MachTen as they are in Personal MachTen.

Tenon is close to releasing Professional MachTen 2.1.1VM, and Personal MachTen 2.1.1. The major differences between the new releases and the prior releases are Virtual Memory support for Motorola 68040-based machines (Professional MachTen only), support for international character sets, enhanced performance for MacTCP-based applications, and the fact that it runs on all Macintosh platforms.

Tenon also offers a full X Windows system. The package sells separately and includes X11R5 Client software, the Motif Toolkit (v1.4), and the MachTen X Windows X11R5 Server Software. As of the latest release, the server is a separate Macintosh application, but Tenon plans to integrate it as a UNIX process.

Although MachTen is worth the price, not all people can afford it.

Keep in mind that MachTen is not for everyone. Although MachTen is worth the price, not all people can afford it. The Personal Workstation MachTen License costs $495. Granted, that is cheaper than Apple's A/UX, but for the struggling college student, there are other options.

MacBSD, which includes the full suite of TCP/IP tools and the compilers and libraries, yet only runs on Motorola 68020 and 68030 machines with FPU math coprocessors, is available on the Internet. However, MacBSD completely takes over your system, requiring a reboot to load the new operating system. With MacBSD, Macintosh and UNIX processes cannot coexist. You cannot cut and paste between your UNIX and Mac applications, and you cannot share the same file system, as you can with MachTen, which runs as an application over the Macintosh operating system. With MacBSD you must format a partition of your hard disk just for UNIX, whereas in MachTen no special file system considerations must be taken.

A/UX is Apple's flavor of UNIX, and as you might expect, also has its limitations. It can only run on a handful of machines, and technical support from Apple has been cut. Like MacBSD, it runs as the lowest level operating system, with a special version of the Macintosh Operating System running over A/UX.

Tenon has announced that it is working on a PowerPC-based PowerMac version of MachTen. The Alice Development Team (MacBSD) and Apple have both announced that they are not.

Tenon plans to work with the Alice Development Team to keep MachTen and MacBSD binaries compatible, so that no recompiling is needed when programs are traded across platforms.

There is also Minix, which is available for somewhere in the neighborhood of $30–50, including a book explaining the system. Although it is significantly less expensive, keep in mind that Minix is not a full UNIX system, and is intended only for learning the workings of microkernel operating systems.

The only major problem that I have had with MachTen (so far) is that the root directory must be kept at the lowest level on the hard drive. This means that all of MachTen's support files and directories will be cluttering

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up your hard drive, and you can't move them to another folder to keep your system looking neat and organized. But that should be fixed in future releases.

At this point, MachTen is the only full UNIX operating system available that will run on all Macintosh computers, from the compact SE to the PowerMac 8100/80. If the power of UNIX, the ease of use of the Macintosh, and low cost are things that you are looking for, MachTen is a great way to go. ■

> **Although it is significantly less expensive, keep in mind that Minix is not a full UNIX system, and is intended only for learning the workings of microkernel operating systems.**

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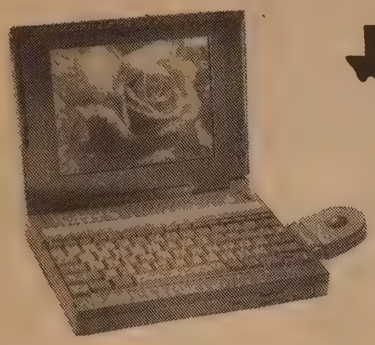

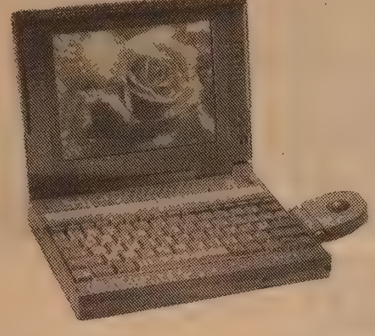

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VGA 640X480, TFT Active Color
1.44 Floppy Drive, 200MB HD, DOS6,
Quick Port Mouse, Windows 3.1
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VGA 640X480, 9.5" Dual Scan Color
1.44 Floppy Drive, 200MB HD, DOS6,
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Quick Port Mouse, Windows 3.1
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TI TravelMate 4000e Color
Win DX4 75MHz

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VGA 640X480, 9.5" Active TFT Color
ext.800X600, 1024x768(256 color), non-interlaced , 1280x1024(16 color)
1.44 Floppy Drive, 455 MB HD,
Quick Port Mouse,DOS 6, Windows 3.1
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VGA 640X480, 8.5" Active TFT Color
ext.800X600, 1024x768(256 color), non-interlaced , 1280x1024(16 color)
1.44 Floppy Drive, 345 MB HD,
Quick Port Mouse,DOS 6, Windows 3.1
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Toshiba T1910

- T910mono / Dual Scan color
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- 33MHz SL Enhanced i486SX
- 4MB Exp to 20MB, 120MB HD.

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TravelMate 4000e MONO

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$1599 SX25 **$2195** DX2/50

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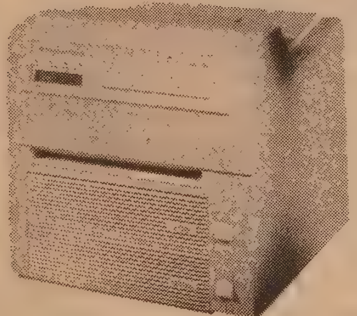

- 8PPM, 6MB RAM , 600DPI,
- Adobe Postscript 2 & PCL5
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- 5PPM, 2MB RAM, 300DPI,
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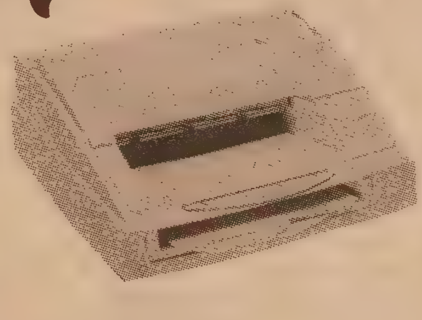
$689 PS23 **$999** PS65

MicroMarc Color



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- 120MB hard drive up plus 1.44MB FD
- PCMCIA-1 Type III slot or 2 type II
- 16-bit sound card, Audio in/out
- EPP/ECP Parallel, 16550 Serial
- 3-5 Hours NiMH battery
- The Point internal pointing device
- Fast SCSI II interface built-in
- Ext. Support: 1024x768(256color)non-
- interlaced. 1280x1024(16 color)
- Multimedia —– ready

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for use with TravelMate 4000M Serial

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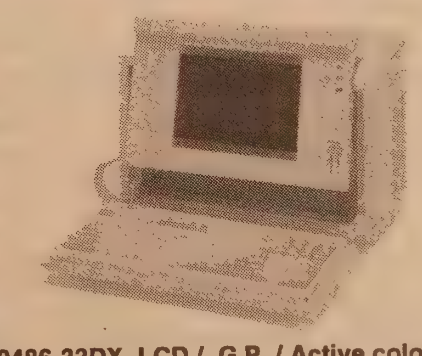

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- Enhanced 101-Key Keyboard
- Hi-Res Mouse

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- Enhanced 101 Keyboard
- Hi-Res Mouse

Motherboard Made in USA by IBM

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- Mid Tower Case w/230W Power Suppy
- 101 Key Enhanced Keyboard
- Hi-Res Mouse

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- Enhanced 101 Keyboard
- Hi-Res Mouse

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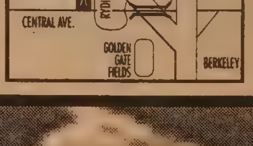

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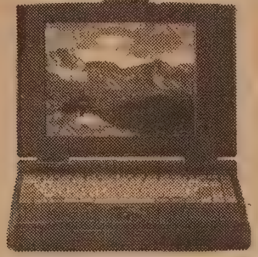

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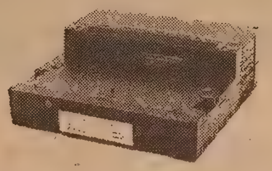

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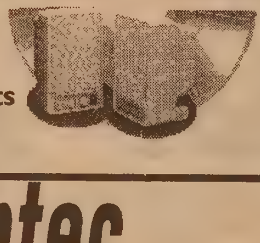

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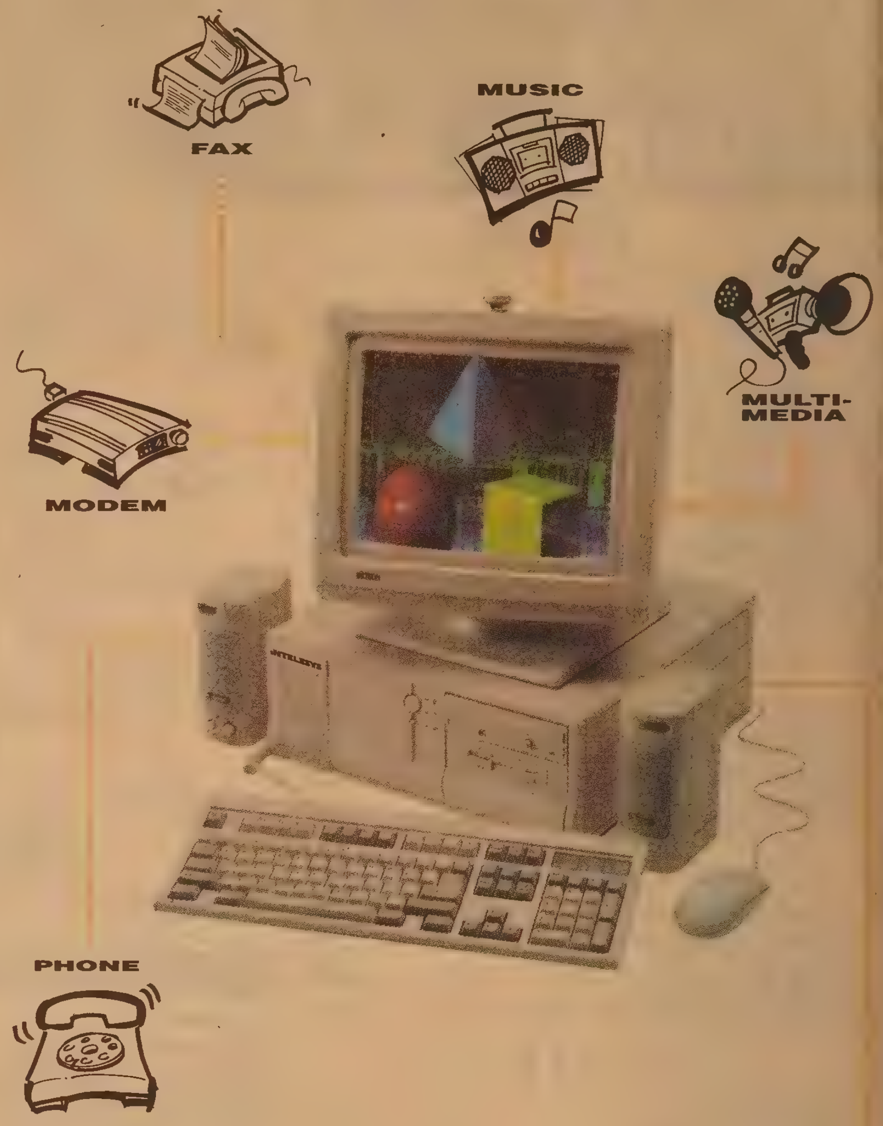
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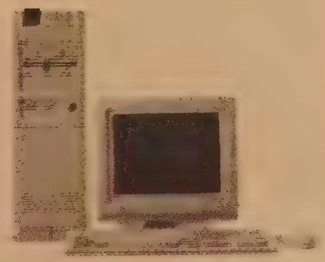

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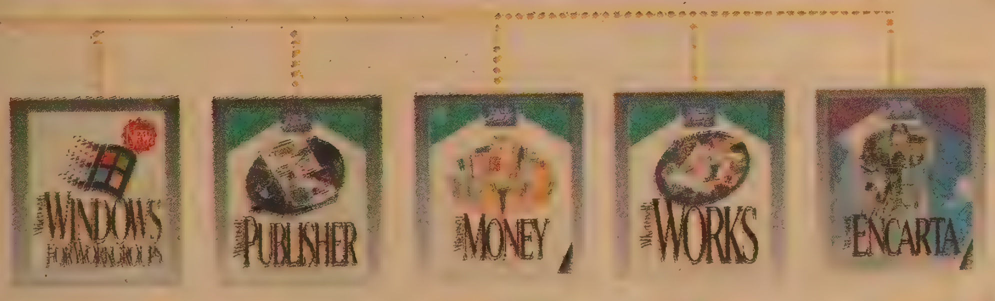

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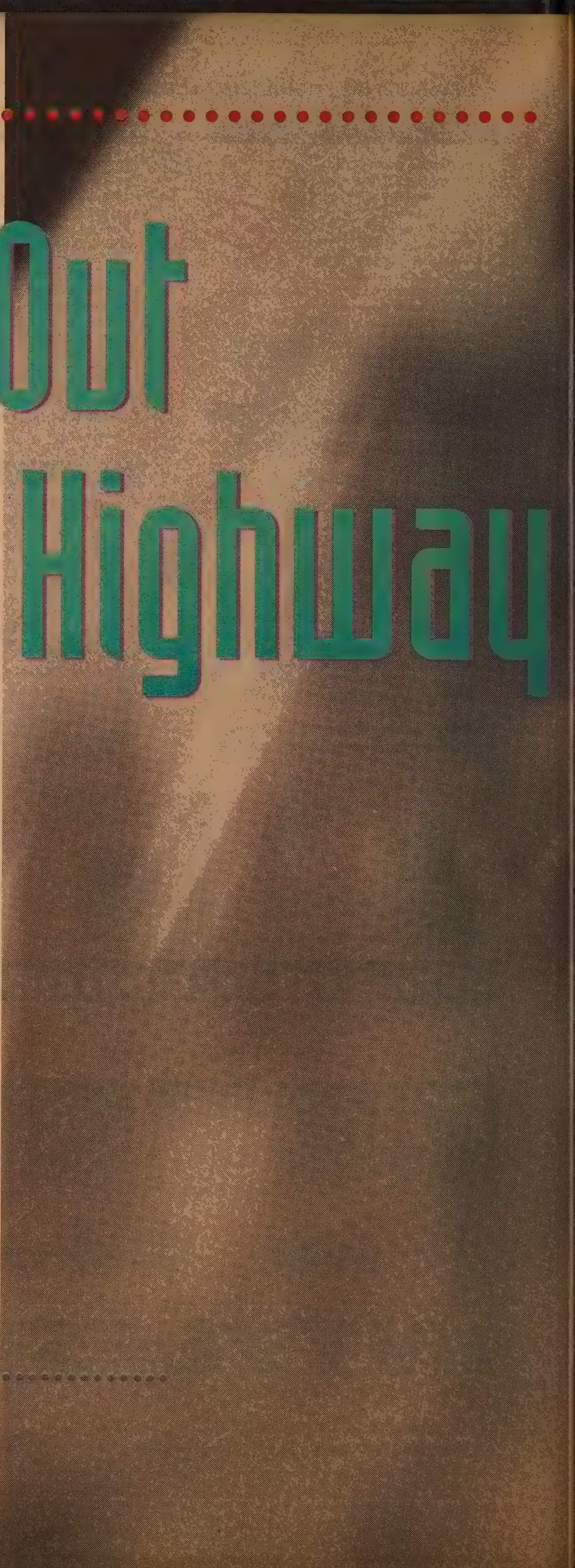

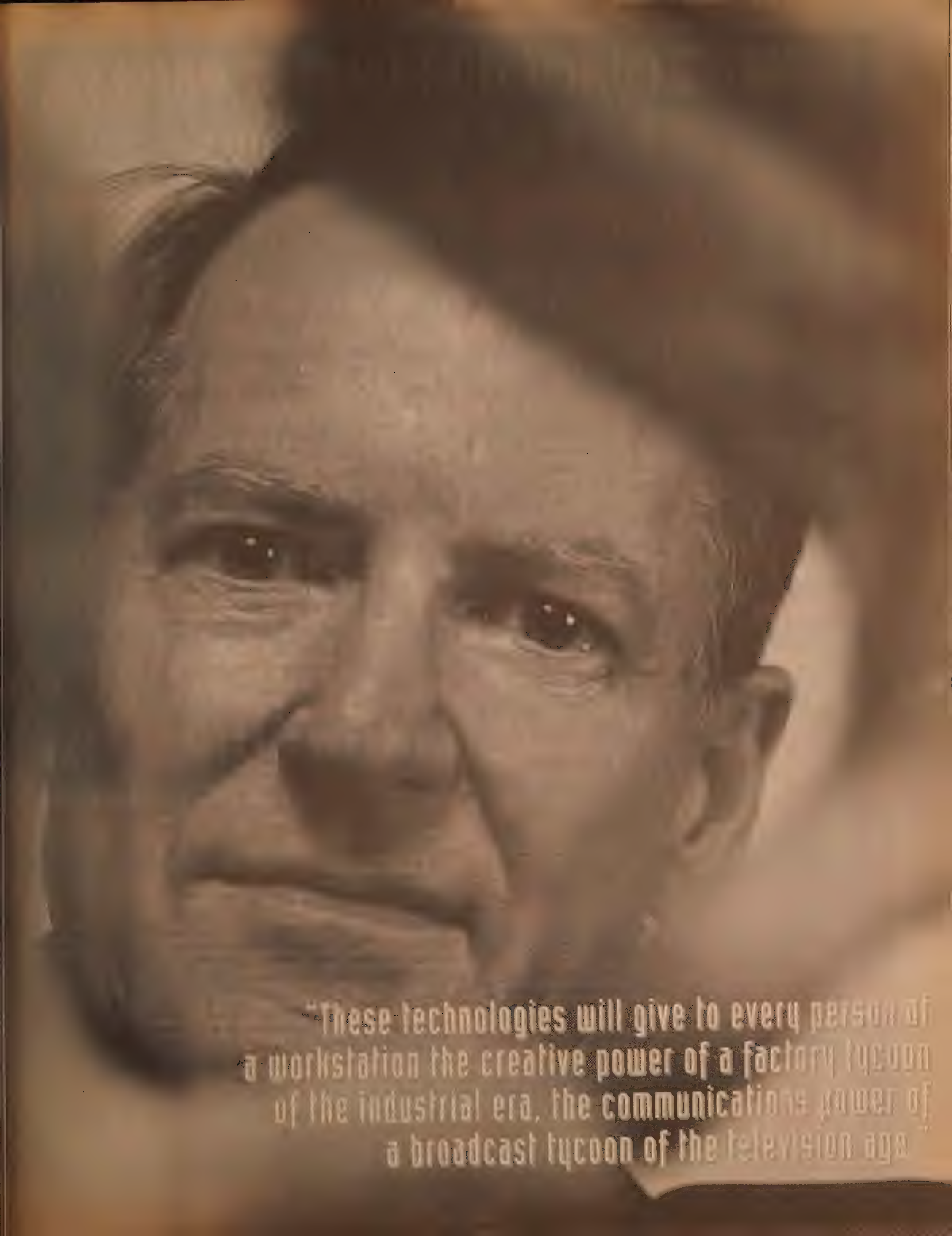

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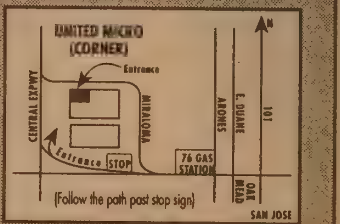

Last month, O.J. Simpson, the LAPD, and hordes of competitive media types provided us with a preview of the infinite connectedness, infinite vulnerability, and infinite exploitation that await us all on the information highway. The lines between news, law enforcement, showbiz, and commercial product blurred hopelessly as the entire world stared fixated at a white Bronco between commercial breaks; the market for secure cellular phones was almost certainly given a boost, not only by the fact that the police located Simpson by his phone calls, but that he was no sooner in custody than enterprising cellular phreaks were offering recordings of his phone conversations for sale.

None of this, one suspects, would be a surprise to George Gilder, who's been pondering innovation-driven social change for some time. His first book, *Microcosm*, was a history of the semiconductor industry and its key players. In his recent book *Life After Television* (now out in an expanded paperback edition) and current project *Telecosm* (both a series of articles in *Forbes ASAP* and a forthcoming book due next year from Simon & Shuster), he discusses the changes being wrought in our daily lives by faster, cheaper, more ubiquitous communications. In recent months he's attracted media attention for, among other things, predicting that the personal computer and not the television will inherit the information superhighway, and stating in no uncertain terms that technological innovation works a lot better without government intervention.

YOU USE "MICROCOSM" AND "TELECOSM" QUITE A LOT, AND "MICROCOSM," AT LEAST, MEANS SOMETHING QUITE DIFFERENT FROM WHAT I LEARNED IN MEDIEVAL LIT. COULD YOU EXPLAIN THE TERMS A LITTLE?

"Microcosm" is the term I use for the whole domain of quantum physics where microelectronics occurs. How you put scores of transistors on the point of a pin is not a Newtonian achievement. You have to be working with the microstructure of matter itself. You have to really be reaching beyond matter, as the book depicts it. It's the overthrow of matter in order to create these devices.

The law of the microcosm is: You take any number *n* transistors and put them on a single chip, and you get *n*-squared performance and value. Single chips are exponentially improving in comparison to centralized systems.

In the microcosm, as things get smaller, they get faster and cheaper and cooler and better. You interconnect a billion transistors in a single sliver of silicon, as we will in the next few years, and you will get a hugely improved performance at radically reduced price. That's in the microcosm.

Well, if you interconnect a billion of anything in the macrocosm, you get decreasing performance at just huge cost. To interconnect a billion macrocosmic elements would be prohibitively expensive, essentially. It's like the micromodules that were the Air Force's idea for the initial integrated circuits—kind of a Lego block concept, with a transistor in every Lego block, and you could put together any kind of architecture you wanted just by interconnecting the Lego blocks. Of course, by their design, an 8086 would be as tall as the Empire State Building, but apart from that problem, the micromodule was a good idea. But it was a macrocosmic idea. And the integrated circuit brought this technology into the microcosm.

That's the essential law of the microcosm. Even though it's more expensive to interconnect chips, nonetheless you do get another exponential benefit out of it. That's the law of the telecosm: You take any number *n* computers and you interconnect them and you get *n*-squared performance and value. And that's the—it's more costly to do that but you do get this other exponential.

This is really Bob Metcalf's idea. Bob Metcalf was the inventor of Ethernet. This explains the tremendous impact of these computer networks on society because they are governed by this exponential power.

Ray Kurzweil tells a story to dramatize the effect of exponential trends. It's

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the dramatic way of conveying the impact of these technologies.

The Emperor of China was totally infatuated with this new game of chess that had been invented for him. He was so grateful to the inventor that he came to him and said, "I'll give you anything you want in the kingdom as a tribute for this wonderful game you gave me."

And the inventor said, "Well, I want one grain of rice. I want one grain of rice on the first square of the chess board, which has sixty-four squares, then I want two grains of rice on the second square. Four grains of rice on the third square, eight grains of rice on the fourth square and so on."

In other words, this exponential process.

And the Emperor happily granted this apparently modest request, and everything went fine for the first thirty-two squares. He could produce the several billion grains of rice fairly well on a quarter square mile of rice fields. But after the first thirty-two squares, things began to get interesting.

There are two ways the story ends. One is, the Emperor went bankrupt because after sixty-four squares, this was several billion trillion grains of rice, which would take the entire surface of the earth, plus the oceans times two to produce. The other end of the story was that the inventor lost his head.

But in any case, to get some perspective on how this applies, Kurzweil estimates that by 1993 there had been exactly thirty-two doublings of computer power since the first digital computers were invented in the early 1940s. So we've now completed the first half of the chess board, where things really become interesting and where the Emperor began to take notice of this process.

Indeed some of the emperors of existing technologies, like broadcast television, are beginning to notice the computer, although they still don't imagine it to be such an important piece of equipment as the television set. They actually suppose that just by adding a few cosmetics to the TV set, TV will last for a long time and have a prosperous career with set-top boxes and HDTV systems and pay-per-view or whatever. They say that PCs are all very good, and they're office equipment, or people might use them to do their accounts or whatever, but they aren't really relevant to their imperial business.

YOU HOLD A CONTRARY OPINION?

I hold a contrary opinion. Because it's after the first thirty-two squares that things become interesting. As we proceed into the second half of the chess board, as Ray puts it, the personal computer is just going to blow away television and all these broadcast technologies associated with it.

SO HOW DO YOU THINK THAT'S GOING TO HAPPEN?

Oh, it's happening right now.

In entrepreneurship you look for your upside surprises. That's your key index of Peter Drucker in his book on entrepreneurship.

I think the big upside surprise in the world economy last year was the production of computers. Early in 1993, both Bill Gates and Andy Grove, the world's leading experts on computer production, essentially, both projected a great year. There'd been thirty-two million PCs sold in 1992, and a lot of people were saying that was an amazing boom produced by a collapse of pricing in some markets, and could not be reproduced in 1993. A lot of people were projecting a decline in PC output in 1993. Instead Grove and Gates both projected around thirty-five million, another great phenomenal year.

Worldwide computer production in 1993 was nearly fifty million, almost 40% greater than most projections. This is a tremendous upside surprise.

It's combined with just runaway growth in networks, the other huge upside surprise. Internet, for example, which for a long time was growing 15% a month, last year grew about 9% a month. Still a tremendous growth, and between 1989 and 1994, over just five years, the proportion of computers connected to networks rose from under 10% to over 60%. It's continued to expand.

Sixty percent of the computers that are being sold today go into homes and

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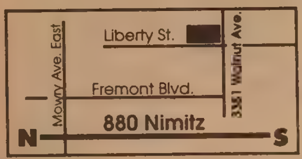

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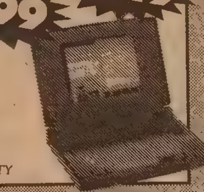

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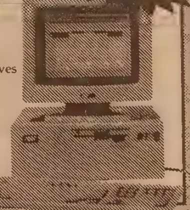

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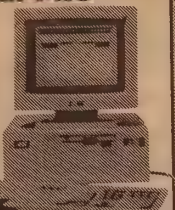

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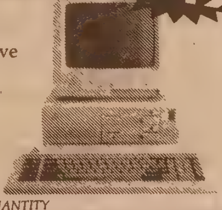

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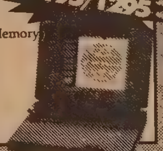

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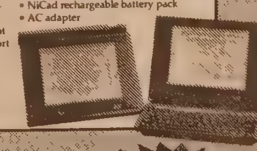

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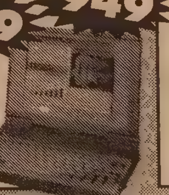

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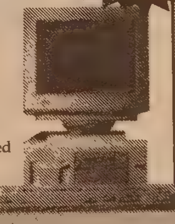

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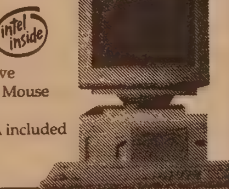

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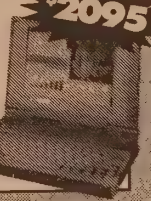

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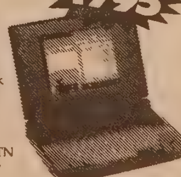

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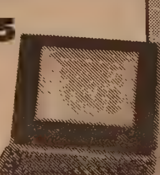

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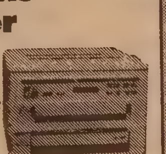

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home offices, small offices. This growth in homes and home offices is about ten times the rate of growth of TV sales. The idea that's widespread, that the TV is this universal appliance that everybody loves to use, and the computer is this special elite device that only a few people understand and most people fear, is no longer true at all.

All this talk about how computers are impossible and no one wants to use them is just nonsense today. Computers are selling at a tremendous pace; people are becoming addicted to the communications interactivity of computers, and it's an incomparably better market than the TV market. People pay four hundred bucks for a TV and a couple hundred more for a VCR. People pay fifteen hundred bucks for their PC and then spend another fifteen hundred bucks on peripherals and software. They use the TV chiefly to distract themselves and their kids, to reduce themselves to some kind of amnesia or couch potato stupor. They use their computers for communications and career advancement, wealth creation. It's really a major social force, and it's life-enhancing rather than stupefying.

So all the people that are going for interactive television and stuff completely misunderstand the digital revolution and how it's happening. All these people that are trying to do set-top boxes and game attachments for the TV are mostly failing and will probably continue to have very disappointing surprises, downside surprises as opposed to upside surprises.

I like to compare 3DO with Creative Labs. 3DO started with everything going for it. It had all the leading venture capitalists—Kleiner Perkins and Vanguard. It had Matsushita committed to manufacture their boxes. It had superb new graphics chips and technology. It was just a really splendid venture by all conventional measures—and when it was first introduced, I just kept asking, "Well, doesn't it connect to the computer?" "No, this is to connect to the TV." And I said, "Then it's not going to work."

People don't really want to interact that much with the TV. The computer is an interactive device. The TV isn't. And the whole culture surrounding it is different and it's not going to work any more than CDI worked. Here Philips spent hundreds of millions of dollars developing and attempting to sell CDI, and it's still a dubious project.

Most of the sort of TV-oriented interactivity products have been a disappointment, while the computer-oriented ones are just bursting forth in constantly dramatic upside surprises. Creative Labs didn't have any of the advanced technology that 3DO had. It had none of the venture capitalists. It had none of the glamour or hype or publicity or anything. It didn't have the endorsements from gigantic conglomerates. It didn't have the glitz or glamour. It had nothing—but it was targeted on the personal computer and it's now a $300 million business.

I think this is sort of a morality tale at this point. The PC is it and as the PC becomes a teleputer, as I call the connected PCs, they benefit from both these exponential forces, both the law of the microcosm and the law of the telecosm. They are the most powerful factor in the world economy. By following the PC, you can reach the pot of gold, but by following the TV, you just end up stultified like most of your customers.

WELL, GIVEN WHAT YOU STATE IS THE CULTURAL DICHOTOMY BETWEEN WHAT YOU USE THE PC FOR AND WHAT YOU USE THE TV FOR, WHAT DO YOU THINK OF ALL THESE MULTIMEDIA ENTERTAINMENT CD-ROMS—PETER GABRIEL VIDEOS AND MOVIE-BASED GAMES AND STUFF LIKE THAT ON THE COMPUTER RIGHT NOW?

I think they're the first generation. I think the multimedia culture will soon resemble book culture. There are fifty-five thousand trade books published every year, and many more thousands of educational books and textbooks of all descriptions. I think multimedia culture will increasingly resemble book culture as time passes, just as the movement of digital desktop publishing generated a huge proliferation of newsletters and magazines and books and documents of all kinds.

The current multimedia pioneers all tend to be struggling, but they are on the bleeding edge. But as these video- and image-based technologies are mastered and become routinized, there's just going to be a huge variety of programming. The CD-ROM will be supplanted with a CD with 2GB or so of capacity, which will mean it can hold a full high-resolution movie on one CD, which I think will be a valuable breakthrough.

As Andy Grove told *ASAP*, by the time the set-top box people get into 30% of the homes where PCs are today and they reach the consumer electronics form factor and price point, the PC will be controlling the TV as a minor peripheral.

So I think that that's the way to think of it—book culture. The key is that in book culture you get your first choice. You walk into Borders or one of these new superstores which are increasingly dominant in the book business, and you get the book you want. In broadcast culture you settle for some lowest-common-denominator product that's been contrived for you by some collaboration between Hollywood and Madison Avenue.

My general feeling is that first-choice culture will always tend to prevail over lowest-common-denominator culture when there's a real opportunity for it. That's what the computer does—it allows the country to escape this stultifying dominance by lowest-common-denominator culture that's targeted toward people's prurient interests and morbid fears and anxieties and ambivalent dread of violence and longing for it. All these sort of "basic instincts," as they say, are necessarily the target of lowest common-denominator media, and I think what the computer allows is the targeting of all career interests, hobbies, intellectual curiosities, special ambitions—the unique and refined interests of people. I think it will be very good for the culture. I think that mass culture has been destructive to the society, and it would be good to have it replaced.

THERE'S BEEN A CERTAIN AMOUNT OF THRASH IN THE LAST FEW YEARS OVER WHOSE MODEL IS GOING TO PREVAIL, THE TELCO MODEL OR THE CABLE MODEL. THE CABLE GUYS ARE VERY ORIENTED TOWARD THE MASS-MARKET, ONE-TO-MANY-AND-NOBODY-TALKS-BACK-TO-YOU MODEL; THE PHONE COMPANY HAS LOTS OF PEOPLE PUTTING LOTS OF STUFF OUT THERE, TALKING TO LOTS OF PEOPLE, A RELATIVELY INTERACTIVE PROCESS. DO YOU THINK THAT THERE IS A TIME AND PLACE FOR EACH, OR THAT ONE WILL PREVAIL?

I think that the open model will prevail because of the law of networks. The more connections, the more valuable all the terminals and the network itself, and so the strategy of controlling both content and conduit and gaining monopoly rents, which is the old cable model, will collapse when you have a broadband world.

Ironically, the creation of a broadband world—it's called an information superhighway—truly does depend on collaboration between cable and phone companies in their own districts, and this is what the current administration wants to prevent at the moment. They fear above all the so-called one-wire model, where you have one wire into a person's home, particularly if it's a cable wire.

But the fact is the one cable link is about seventy-thousand times as capacious as a 4kHz telephone wire, and there just is no way that the telephone industry can duplicate cable's 60% penetration of homes in the United States with broadband connections over the next ten years or more. By combining the fiber-optic capability of the phone companies, which is about nine times as extensive as the fiber-optic deployment of cable companies, with final subscriber loop connections to homes of the cable industry, we can have an information superhighway over the next five years.

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This is really crucial. I think it's going to happen. I think that cable is going to end up being just vital to the future of the computer industry. Intel, Zenith, and Digital Equipment, among other companies, have all introduced cable modems over the last couple of years; Digital Equipment's modem allows full Ethernet capabilities extended over 70 miles of a cable network. These cable modems will give the online computer services, like America Online and CompuServe and Prodigy and all these networks, real broadband capability. When these online networks can transmit images and video and films and files of all kinds, it will be the beginning of the end for the television industry.

I honestly believe that within five years or so the cable companies are going to be making more money off computers than they are today off television programming. In fact, the cable network is going to become a computer network.

The key point is that cable PC will become as important as cable TV is today. The reason people underestimate computers today is because their bandwidth is so limited because of the phone lines. When they suddenly can transmit megabits a second, the whole nature of the medium will be transformed. I think it will be the path by which the PC industry will fulfill its manifest destiny of blowing away the television industry in this decade.

SO WHERE DOES WIRELESS FIT INTO ALL THIS?

Wireless is vital for anything that's mobile. Human beings are mobile so they need a lot of wireless connections. Wireless connections are going to be very important—indeed, wireless bandwidth is increasing as fast as fiber bandwidth and fiber bandwidth is doubling every year or so. You have this tremendous expansion of fiber bandwidth from a much higher level, but you have a similar expansion of wireless bandwidth.

There have been major innovations in the last couple of years introduced on the wireless side. One of the key inventions is CDMA, code division multiple access technology from Qualcomm, which allows you to have 100% frequency reuse. You can use all the frequencies in every cell, and as you reduce the cells to smaller and smaller sizes, you can multiply bandwidth to an almost unlimited extent. CDMA is almost crucial, I think, for very small cells.

Time Warner and Qualcomm have just introduced a CDMA service operating over cable in Orlando.

THIS IS THE SILICON GRAPHICS THING?

No, no. Silicon Graphics is the set-top box in Orlando. This is using that same cable bandwidth for back haul, but using CDMA wireless to give personal communication services, PCS phones, lightweight, low-power phones, portable, wireless phones, to Orlando.

Beyond that there's also technology developed by Steinbrecher Corporation in Burlington, Massachusetts—a box that's essentially a broad-band digital radio. The usual cellular base station includes 416 radios, one for each channel, and it's hard-wired for one modulation scheme, whether it's time division multiple access or amps or TDMA or CDMA or some digital packet data scheme like CDPD—there are all these various modulation schemes and protocols used for wireless traffic, and specific frequencies used. Essentially, existing cellular technology requires a separate radio for each frequency, and a channel and application-specific equipment for every modulation scheme and protocol used in the system.

The Steinbrecher is a digital radio which replaces all this hard-wired, analog electronics with one broad-band radio. This radio can essentially take all the contents of the cellular band, all the signals being transmitted in the cellular band, reduce them to base-band signal, convert the base-band signal to the analog signal to a digital bitstream and then, in the digital realm, employ digital signal processors to sort out all the different calls and channels and modulation schemes and protocols in that entire cellular band. You replace 416 radios and all the associated apparatus with one box the size of a briefcase that can outperform all of the entire process.

This technology is in the process of being introduced by McCaw as part of its CDPD project—cellular digital packet data for computer connections over the cellular network.

But the real importance of this technology will be as it's launched as a minicell, and that will happen over the next year. That will really change wireless drastically.

IN WHAT WAY, PRACTICALLY SPEAKING?

Well, you get to have a base station on every telephone pole and up every elevator shaft and eventually in every household, for a reasonable price. And that base station won't be tied to one modulation scheme. You won't need hybrid technologies. It will be able to handle any kind of communications—whatever you throw at it. You have to program it for each one you throw at it, but it is programmable. It's a programmable digital device. As this technology is introduced and becomes pervasive, it joins with these other technologies to make bandwidth as available in the wireless domain for mobile applications as it is now in wire-line domain.

Then beyond that, the Teledesic program will come on toward the end of the decade. This is Bill Gates's and Craig McCaw's project which will bring broadband digital communications to all the many parts of the world which have none. Most of the world, half the world, has almost no telecommunications at all. Even though the spread of fiber optics and various cellular wireless technologies will make tremendously rich communications ubiquitous in urban and suburban areas, this Teledesic project has enormous promise to extend it all over the world. It's a low earth-orbit satellite concept like Iridium, but unlike Iridium it's not focused on extending telephony—voice communications. It's for broadband digital communications, digital computer links, up to 1Gbit a second.

IS THE IDEA THAT THIS SHOULD BE ACCESSIBLE TO EVERYBODY REGARDLESS OF WHERE THEY ARE?

That's right.

SO FROM A USER'S STANDPOINT, WHAT WOULD YOU NEED TO ACCESS THIS WHEN IT'S DEVELOPED?

You need a computer terminal and a little antenna. The antenna doesn't need to be more than 1" tall because it's in the 28GHz KA band of the spectrum. So you can have very small antennas and relatively low power. You can have extremely low bit error rates for digital data communications. You can also have voice, you can have connections, anything from 16kbits to 1.2Gbits. It's bandwidth on demand.

There will be a combination. Wireless will be very important and increasingly valuable. For voice communications, I think wireless will completely dominate. Virtually all phones will be wireless as the digital revolution proceeds; I think the key to succeeding in that world will be understanding that bandwidth is abundant, and you use bandwidth to enhance quality so that your voice quality and data transmission facilities are superior to current wire line voice and data communications.

Those are the companies that are going to win. The companies that try to economize on bandwidth, assuming that bandwidth is scarce, and use half-rate vocoders and systems like that to use less bandwidth, are going to fail because the ubiquitous phones will have better acoustics than existing phones. That's what really will ignite their success, where you preferentially choose your portable device against your wire line device because it's better acoustics as well as more mobile.

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So you have this picture of an infinitely interconnected world across which people are moving gigabits and gigabits of stuff, uploading it, downloading it, buying and selling it. How does this work? Who's paying for it, who's buying what, where are the subsidies, where are the hidden costs? Is the model going to change from the one where now you go to Blockbuster and you rent a movie, or you go to the bookstore and you buy a book?

I think that more and more of the economy will flow through this net. As people move up the Maslow ladder or whatever—your basic physical needs for food, shelter, housing, transportation, or whatever—increasingly our needs are intellectual and spiritual, informational and educational. And so more and more of the economy will flow through these systems.

So very low-cost media will yield big rewards for the people who supply them. In other words, just as the cost of MIPS and bits dropped ten thousand-fold over the last decade or so, it didn't demolish the market for computers. The market for computers exploded. So the collapse in the price of bandwidth that is predictable over the next decade will not destroy the business of the bandwidth suppliers. It will make their business the central nervous system of the world economy.

The first point is that it will pay to supply this bandwidth. It's going to be a good business, not a bad business. As things drop in price, they generate more profits, even at lower margins. This is the secret of enterprise in this era—if you're losing money on every unit sold, you can indeed triumph by selling more units.

The watermelon thing.

What's the watermelon thing?

The joke about the two guys who went into business selling watermelons. They'd buy watermelons for $1 and drive them to town and they'd sell them for $1 and things would go along and they would sell lots and lots of watermelons. Every day they'd sell out their little pickup truck but they wouldn't make any money, and so they were conferring as to what they had done wrong and they concluded they needed a bigger truck.

[*laughter*] Well, that's just right. They do need a bigger truck. If you are losing money at a high price, the way you make money is to reduce the price. And that's the principle.

In any case, what will happen is that a lot of the costs which are now associated with distribution will be eliminated. This is whether you're talking about movies, where 70% of the current costs derive from distribution and advertis-

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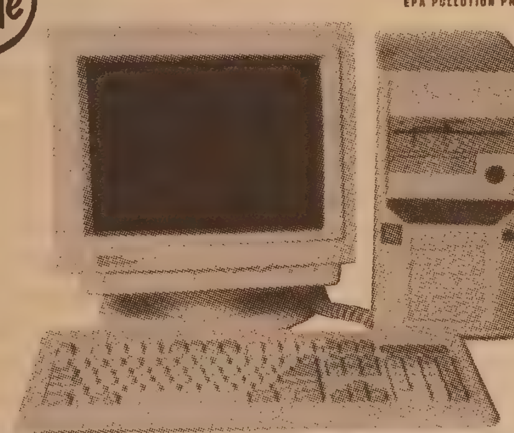

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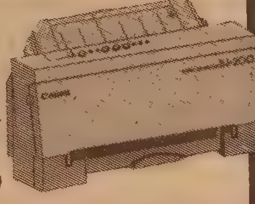

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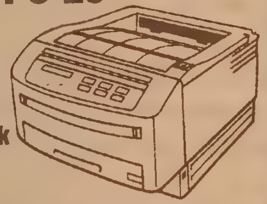

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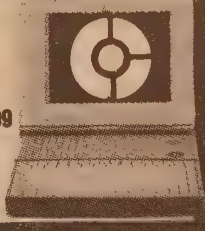

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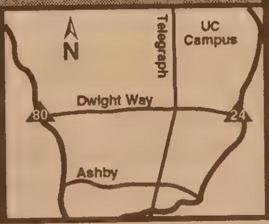

ing; or you're talking about newspapers, where over 50% of the costs come from printing and distribution; or whether you're talking about selling computers, where today a lot of the costs come from distribution and warehousing and advertising and whatever. The network will allow you to eliminate most of these costs, these middle costs. This girth of fat in which most economic production is enclosed today will melt away into the new media and the new communications.

SO WHAT HAPPENS TO ALL THE THINGS THAT ARE IN THAT SPARE TIRE, LIKE THE ADS THAT FINANCE THE DISTRIBUTION——

Well, ads become much more effective. Current ads are just incredibly inefficient. Broadcast ads, for example, support less and less real programming as time passes. You need more and more ads for less and less substance. Broadcast advertising focuses on capturing people's eyeballs for a few seconds and minutes, with no guarantee or even clear means to a sale in most cases. So what we think of as advertising is mostly a tremendously inefficient broadcast commercializing, and it will be blown away by new transaction-oriented commercial processes on the net.

HOW MIGHT THAT WORK?

Well, say you receive your newspaper on a flat panel, a news panel. It's about the size of a clipboard. And you get the front page of the newspaper on it. You click to a story on the new Apple Power PCs that are being launched, Power Macs. The story comes up and fills the screen, which now has high resolution and is as readable as paper, and there's an icon at the bottom or whatever for you to click to buy one of these devices if you want. The first icon is to see an advertisement which fills up the screen if you choose to see it, then provides further opportunities to see textual descriptions of the product and its specifications. Then other ways to see places where this device is available, or ways it can be delivered to you if you want to purchase it, and different price points and different configurations.

In the end it takes you step-by-step through to a transaction, and that process is just incomparably more efficient than the current system where they have an ad for a Mac with maybe an address but no real sense that anybody is actually purchasing anything.

IMAGE ADVERTISING.

It's image advertising, that's right. It really is.

So I think advertising will be much more effective, but it will have to change a lot. You won't be able to trick people into watching your ad. You'll have to choose advertising copy or whatever that people deliberately choose to read.

KIND OF WHAT THE CATALOG GUYS ARE DOING NOW.

Yeah, what the catalog guys are trying to do.

So I think this new technology will radically change the entire advertising business. All this constant bombardment by irrelevant and distracting and mostly ineffectual images will expire; advertising will be much more effectively targeted, and people will get it when they want it.

SO IT WILL ESSENTIALLY BE PULL RATHER THAN PUSH.

That's right.

Meanwhile, there will be some events that everybody will want to see, certain kinds of national events, Super Bowls or whatever, which lots of people will watch in common. There probably still will be some advertising associated with it.

But in general the idea of mass advertising will collapse just as all mass media become much less effective and pervasive. The lowest-common-denominator appeals will become less and less useful.

ONE OF THE ONGOING ISSUES IN MAGAZINE PUBLICATION IS THE ADVERTISING-EDITORIAL DICHOTOMY——HOW MUCH THE ADVERTISERS STEER THE COURSE OF THE EDITORIAL, AND WHO CAN YOU TRUST, AND STUFF LIKE THAT. DO YOU SEE THE LINE BETWEEN ADVERTISING AND EDITORIAL BLURRING? DO YOU SEE IT BEING SORT OF A BIG SOUP OF INFORMATION, AND YOU'LL PULL OUT WHAT MAKES SENSE TO YOU, REGARDLESS OF SOURCE?

I think editors will be very important. I think that this idea that somehow all writers will just set out independently without editors, put their material in encrypted form on the net, and expect people to pay to decrypt it, is just unrealistic and naive. I think there will be need for all kinds of publications, and they will be dominated by editors who earn the trust of the readers. I don't think that will change.

As information becomes more and more accessible and ubiquitous it will be more and more baffling in its mass and variety; there will be more and more need for people to sort it out and perform these filtering functions. So I think publications will still be significant.

But that doesn't answer your question about the difference between advertising copy and the sort of editorial substance of the magazine. My favorite journal, what I read most faithfully and regularly, is *EE Times*. A lot of the copy in *EE Times* is written by people in the various computer and communications companies, actually describing products and technologies which they also are selling. But in doing this they have to write it in a way that is not baldly self-serving. They have to actually explain the technology and mention that there are competitors producing it and make some sort of honest effort to describe some of the competitive products. These are really written infomercials in a sense.

I think there will be a lot of those, but they are chosen by the editors. A lot of these articles are better than the articles that reporters might write who had much less time to explore and really master the technologies at hand. So they don't reduce the value of *EE Times*. They enhance the value of *EE Times*. You gladly read them and pay for them.

So I don't think they corrupt the magazine. I think they're a legitimate part of the magazine. There is this kind of convergence. But it doesn't mean that you don't also have columns by independent writers and editorials and reports that are different, and the reader is capable of differentiating between the different kinds of material presented to him.

At the MIT Media Lab, they had a discussion a couple of months ago where one analyst was projecting that advertisers would begin making deals with the reader: If you click onto my ad, we'll give you some Green Stamps or some AAdvantage miles or whatever. The implication is that the old model of advertising persists, that advertising is somehow value subtractive.

It's the value subtractive model of advertising which currently dominates. And I think that's the wrong way to look at it. Advertising has to be value-added in a broadband world. If you had to think of buying an issue of *MicroTimes* or *PC Magazine* or *ASAP* for that matter, with advertising or without, you'd choose the one with the advertising. The advertising contributes to the value rendered. You would actually, in all likelihood, be willing to pay substantially more for the edition with the ads.

This implies that they are adds rather than minuses. I think that broadcast advertising mostly consists of minuses, and what we're going to have is real

continued on page 300

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All Systems Are Pre-loaded with:

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- Quicken for Windows 3.0

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TARANTULA 64

The Tarantula 64 possesses all the characteristics of a professional graphics accelerator. With high refresh screens, this "Big SPiDER" can operate at 75Hz non-interlaced in 1024x762 resolution with 16.7 million colors. It also supports 1600x1200 with 64K colors in non-interlaced mode. In addition, the 32-bit true color format DAC can optimize the performance and clarity of high refresh rates in Windows for professional quality photo images.

RESOLUTION	COLORS	MINIMUM MEMORY REQUIRED	SELECTABLE REFRESH RATES
640 x 480	16 to 16M	2MB	60, 72, 75
800 x 600	16 to 16M	2MB	60, 72, 75, 87i
1024 x 768	16 to 64K	2MB	60, 70, 75, 87i
1024 x 768	16M	4MB	60, 70, 75, 87i
1280 x 1024	16	2MB	90i
1280 x 1024	256	2MB	60, 72, 75, 90i
1280 x 1024	64K	4MB	60, 72, 75, 90i
1600 x 1200	256	2MB	60
1600 x 1200	64K	4MB	60

Available colors: 16, 256, 32K, 64K, 16M, i=Interlaced
(Graphics modes support varies between applications.)

COMPATIBLE DRIVERS SUPPORT:

MS-Windows 3.1
MS-Windows for Workgroups
MS-Windows NT
MS-Word (DOS)
OS/2 v2.1
Autodesk ADI 4.2
  AutoCAD
  AutoShade
  3D Studio
Microstation
Lotus 1-2-3 Release 2.x

WordPerfect 5.1
CADKEY/DataCAD
CADVANCE
VersaCAD
Generic CADD 6.0
SCO Open Desktop

Also Available: Japanese and Chinese MS-Windows Drivers. (Included with this graphics card or packaged with the software under S3)

ARCHITECTURE:

Accelerator:	S3-Vision964
Bus Available:	32-Bit PCI 32-Bit VLB
Display Memory: VRAM	2MB or 4MB
Video Connector:	DB-15
Video Signal:	Analog

A better card at a better price

FEATURES:	SPIDER TARANTULA 64	DIAMOND STEALTH 64
• Up to 4MB VRAM	YES	YES
• 1024 by 768 resolution in 24-bit color (16 Million Color)*	YES	YES
• On-the-fly resolution change*	YES	YES
• On-the-fly refresh rate change	YES	NO
• Feature connector*	YES	YES
• 64-bit graphics accelerator engine*	YES (S3-964)	YES (S3-964)
• High dot clock (high refresh rate)*	YES	YES
• Virtual screen*	YES	YES
• Refresh rate check	YES	NO
• Easy installation program	YES	NO
• 32-Bit RAMDAC	YES	YES
• Local market price (w/2MB)	@$285	@$339

* Feature that a "perfect graphics accelerator card" should have as defined by PC Magazine July 1994 Issue.

The choice is clear! TARANTULA 64

(Retailers Please Call (408) 526-0535 for Your Distributors)

SPiDER® Graphics, Inc.

580 Charcot Ave., San Jose, CA 95131
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Paramount Computer, Pleasant Hill	(510) 680-0204
Art Computer, Milpitas	(408) 946-7852
Computer Express, Santa Clara	(408) 247-1996
Pixel USA Computer, San Jose	(408) 929-7218
HD Computer	(408) 720-0493
Computer Art II, Sacramento	(916) 366-7128
UMiracle Microsystems, Fremont	(510) 226-6746
Sigma-Com	(408) 942-4881

Cache on Graphics Card?
YES, Available First from SPiDER Graphics.

SPiDER 256 CACHE

- Hardware BitBlt and Cursor
- 32-Bit Color Expansion
- Zero Wait State Operation
- High Resolution
- Vesa Display Power Management
- Optional Flash Rom Support

Video Caching
16.7 Million True-Color
Dos / Windows
"GUI" Accelerator

Advantages of Video Caching:

1) Improve screen refresh to yield a clear graphics image just like the more expensive VRAM based cards.
2) Increase DOS and Windows performance up to 30%.

There are cards that perform extremely well in Windows, but no performance in DOS applications, especially graphics extensive games. There are also cards that perform well in DOS, but no Windows performance.

PERFORMANCE	(Tested on Micronic 486-66DX2 w/256 Cache)	
Dos:	Landmark 2.00	21.480 Characters / Second
Windows:	Winmark 4.0	13.9 Million (1024 x 768, 256 Colors)

SPiDER Graphics Presents:
"The Best of Both Worlds" SPiDER 256 Cache

Games players can enjoy a smooth animation of favorite adventure or simulation packages. Window users can expect quick scrolling through documents, spread sheets and pictures of you own creation in Paint Brush.

RESOLUTION	COLORS	VCACHE	MEMORY	REFRESH RATE
640 x 480	256	128K	1MB	60, 75,
640 x 480	64K	128K	1MB	60, 75,
640 x 480	16M	128K	1MB	60
800 x 600	256	128K	1MB	56, 60, 72, 75
800 x 600	64K	128K	1MB	56, 60
1024 x 768	256	128K	1MB	60, 70, 75, 87(i)
1280 x 1024	16	128K	1MB	87(i)
1024 x 786	64K	256K	2MB	87(i)
1280 x 1024	256	256K	2MB	87(i)

(i=interlaced) Graphics modes support varies between applications.

DRIVERS

- Windows NT 3.1
- Windows 3.1
- OS/2 Version 2.1
- AutoCAD R11, R12
- AutoSHADE
- 3D Studio
- Lotus 1-2-3 Release 2.X
- WordPerfect 5.1
- MS-Word 5.X

Drivers are updated and added on a regular basis. Check the SPiDER Bulletin Board or contact SPiDER Technical Support for availability.

UTILITY

- Virtual Screen (Resolution and Refresh Rate on-the-fly)
- Refresh Rate Check
- Adjust Screen

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w/1MB & 128K

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w/Intel CPU	$495
w/AMD CPU	$465

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- 101 Enhanced Keyboard

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- 8K Internal Cache
- 128K External Cache Exp. to 256K
- Shadow RAM
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

486DX-33MHz 128K Cache

w/Intel CPU	$445
w/Cyrix CPU	$575

- 1MB Expandable to 32MB on Board
- 8K Internal Cache
- 128K External Cache Exp. to 256K
- Shadow RAM
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

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Intel 80486SX-25MHz CPU

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- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

486SX-33MHz w/128K Cache $31

Optional for 486 Systems

VESA Local Bus Motherboard	Add $10
AIR VESA Local Bus Motherboard.	Add $50
Micronics VESA Local Bus Motherboard	Add $195
VESA/EISA Motherboard	Add $120
PCI Motherboard	Add $120
VESA IDE CARD	Add $10
VESA SVGA Card w/1MB	Add $70
SpeedStar 24X	Add $80
Orchid Kelvin 64 VESA w/1MB RAM	Add $135

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w/ system purchase

14" Mono Monitor & Card	$95
Super VGA Monitor (1024x768 0.39) w/SVGA Card 512K	$220
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- 101 Keyboard

586 Pentium 66MHz VESA/PCI
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- 1MB Expandable to 128MB
- 256K Cache
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- 1:1 Interleave HD/FD Controller
- Tower or Desktop Case w/Power Supply
- 101 Keyboard

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486DX-40MHz w/128K Cache

w/AMD 486-40MHz CPU......$410
w/Cyrix CPU, Math Chip $315

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- 1:1 Interleave HD/FD Controller
- Socket for 80387
- Tower or Desktop Case w/power supply
- 101 Enhanced Keyboard

$220
386SX-33MHz

- 1MB expandable to 16MB on Board
- Shadow RAM
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop Case w/power supply
- 101 Enhanced Keyboard

- 212MB $180
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- 420MB $235
- 540MB $305

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Maxiswitch 101 Key	35

Floppy Drives

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TEAC/Epson 1.44MB 3.5"	45

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Fujitsu 1.2GB SCSI II 8.5 MB	680

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14,400 Modem, 14,400 Fax	75

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Trident SVGA w/ 1MB RAM	60
Orchid Kelvin 64 VLB 1M/2M	140/190
ATI Ultra Pro VLB 2MB	275
Diamond SpeedStar 24X	85
Diamond SpeedStar Pro VLB	105
Diamond Stealth 24 VLB	135
Diamond Stealth Pro 1M/2M	215/265
Diamond Viper w/2MB VESA/PCI	315
AT M I/O (2S, 1P, 1G)	15
IDE Card w/cable	15
Promise IDE VESA Cache Controller	110
Future Domain SCSI Card	75
Adaptec SCSI 1542C	175
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386SX-33MHz	$75
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486DX-33MHz w/Intel CPU 128K Cache	320
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486DX2-66MHz w/Intel CPU 128K Cache	375
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Miscellaneous

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387-25/33/40	40
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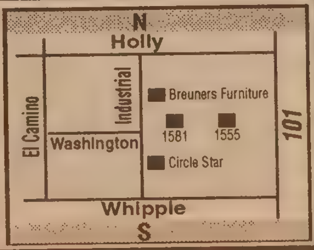

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Pentium* 90 w/512K	PCI, VLB	$1,301					$2,233	$2,403
Pentium* 66 w/256K	PCI, ISA	$1,131					$2,063	$2,234
Pentium* 60 w/256k	PCI, ISA	$1,015				$1,916	$1,947	$2,118
i486DX4-100 w/256K	VLB	$792				$1,646	$1,678	$1,848
A486DX2-66 w/256K	VLB	$463			$1,061	$1,317	$1,349	$1,519
C486DX-33 w/256K	VLB	$341			$939	$1,195	$1,227	
I486SLC2-66 w/64K	VLB	$322		$740	$912	$1,160	$1,191	
i486SX-33 w/128K	ISA	$275		$700	$854	$1,106		
i486SX-25	ISA	$244	$499	$669	$823			
A386DX-40 w/128K	ISA	$204	$460	$629	$784			
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PCI Systems include PCI IDE Controller and Cirrus Logic 5428 1MB PCI Graphic Card

VLB Systems include VLB IDE Controller and Cirrus Logic 5428 1MB VLB Graphic Card

CPUs: A - AMD; C - Cyrix; I - IBM; i - Intel

** Intel Pentium CPU based Systems*

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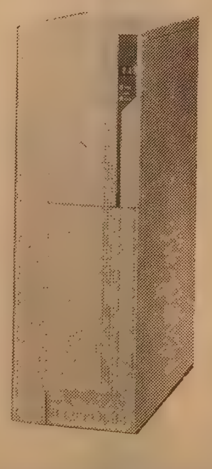
Multi-Media System

A486DX2-66 w/256K VLB
Compact Med-Tower Case
8 MB RAM
IDE w/2SPG VLB
1.44 MB FDD
212 MB HDD
CL5428 1 MB VLB
15" 1280 x 1024 .28 NI
Double Speed CD-ROM
Pro Audio Spectrum 16
LabTec Speakers
KeyTronic K/B
LogiTech Mouse
MS DOS 6.21, WIN 3.11

$1,643

ASA... ...Proven Systems for all Applications

The Thoroughbred Workstations



Hardware platform for Multiple Operating Systems... and Applications demanding Workstation Power... AutoCad, P-CAD, Windows NT

The THOROUGHBRED Workstations - Top-of-the-Line - Power, Functionality, Price

ARCHITECTURE	UMC(cs) - Intel	UMC(cs) - Intel	Intel(cs) - Intel	Intel(cs) - Intel	Intel(cs) - Intel	MIPS*
Motherboard	MustangS	MustangSZ	CapricornI	CapricornI	CapricornS	SH-RISC
CPU	Intel 486DX2-66	Intel 486DX4-100	Intel Pentium 60 Mhz	Intel Pentium 66 Mhz	Intel Pentium 90 Mhz	MIPS R4450 - 150
CPU Power Est. (Mips)	21	42	42	42	60	75
Cache	256K - 512K	256K	256K - 1MB	256K - 2MB	512K	512K - 2MB
RAM	16MB - 128MB	16MB - 64MB	16MB - 96MB	16MB - 160MB	16MB - 128MB	16MB - 256MB
Exp. Slots	2 VESA, 7 EISA	3 VESA, 7 EISA	4 PCI, 4 ISA (1 Shared	4 PCI, 4 ISA (1 Shared)	4PCI, 2VLB, 3ISA(1sh)	2 VESA, 5 ISA
Drive Controller	Adaptec VLB SCSI-2	Adaptec VLB SCSI-2	PCI IDE	PCI IDE	Adaptec VLB SCSI-2	32 Bit SCSI-2 Built-in
I/O	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P	(2) 16550 S, P
Video Card	SPIDER BLK 2MB	ATI PRO 2MB VLB	ATI PRO 2MB VLB	ATI PRO 2MB PCI	ATI PRO 2MB PCI	GUI S3 1MB - 2MB
Video Power (Mws)	54	56	56	56	56	_
Operating System	MS DOS, WFW 3.11	MS DOS, WFW 3.11	MS DOS, WFW 3.11	MS DOS, WFW 3.11	MS DOS, WFW 3.11	MS DOS, WFW 3.11
Case	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS	SuperT w/300W PS
Price	$1,842	$2,165	$2,195	$2,318	$2,706	$3,596

The Thoroughbred Servers

Outstanding Price Performance and Functionality for Application and Networking Servers

MOTHERBOARDS & CONTROLLERS

ISA/EISA MOTHERBOARDS

286-12/20	**$35/50**
386SX-40	**$57**

THE STALLION SERIES

ISA 386DX-40 w/128k	**$92**
ISA 486SX-25	**$130**
486DLC-40 w/128K	**$133**
ISA 486SX33 128K	**$162**
ISA 486DX-33 256k C/AMD/Intel.	**$221/238/328**
ISA 486DX-40 256k Cyrix/AMD	**$240/251**
ISA 486DX-50 256K Cyrix/Intel	**$337/380**
ISA486DX2-50 256k C/AMD/Intel	**$257/289/349**
ISA 486DX2-66 w/256k AMD/Intel	**$345/367**
EISA 486DX-50 w/256k	**$512**

VLB/PCI MOTHERBOARDS

486/P24T

MustangF 486SX-25 ISA/VESA	**$171**
MustangB 486DX-33/40 256 Cyrix	**$222/241**
MstngS 486DX-33 256C/AMD/Intel	**$229/246/335**
MustangS486DX-40 256K Cyx/AMD	**$248/259**
MustangS486DX-50 256k Cyx/Intel	**$344/388**
MustangS 486DX2-50w/256K Cyrix/AMD/Intel	**$265/297/357**
MustangS 486DX2-66 256K AMD/Intel	**$353/375**
IBM Alaris 486SLC2-66 wo/w Math-Co.	**$210/226**
IBM BlueLightng 486BL3-75 wo/w M-C.	**$412/437**
Micronix 486-33/50/66	**$510/563/549**
AMI SVoyager 486-33/50/66 Intel	**$577/630/617**
Pegasus N 486-33/50/66 Eisa/Vesa	$460/512/499
Micronix 486-33/50/66 Eisa/Vesa	$790/843/829
AMI Ent IV 486-33/50/66 Eisa/Vesa	$729/781/768

Intel PENTIUM and DX-4

MustangS4 486DX4-75/100 256K	**$630/688**
Capricorn 0 512K 60/66 VLB	**$876/1000**
CapricornI 256K PCI 60/66 Mhz	**$916/1039**
CapricornS 256k PCI 60/66	**$944/1067**
CapricornS 512 PCI/VLB 90Mhz	$1218
PegasusA PCI/EISA 256K 60/66	$1067/1190

RAID Controllers in Networking Section

ISA/EISA CONTROLLERS

IDE/MFM/RLL & FAST I/Os

Mustang IDE 2FD-2HD/4FD-2HD	**$14/28**
Mustang IDE w/ 2SPG	**$15**
Promise IDE Caching DC200 2FD/4HD	**$97**
Ultrastor 15C IDE Caching (upto 8MB)	**$197**
FAST-PIG IDE,IO/IO w/16C550 Uarts	**$40/30**
ULTRA-IO 4S/2P 4 16C550 Bi-Dir	**$96**

SCSI

Future Domain Compatible16 bit	**$49**
Trantor SCSI Adapter T-130	**$52**
ADAP 1522 16BIT Card/Kit	**$70/139**
ADAP 1542C Card/Kit	**$170/250**
ADAP 1542C+ Kit (w/Corel SCSI)	**$317**
ADAP 2742 EISA Fast SCSI2 C/K	**$304/357**
Bus Logic BT747S/KT 747S	$294/316
DTC3290AS 7HD&4FD Caching	$441
Future Domain TMC1680 SCSI II C/K	$146/203
Ultar24F EISA SCSI Card/Kit	$325/351
AMI EISA SCSI II Caching wo/w pwrpk	$373/410
DPT Smart Cache3 EISA SCSI	$331
Mylex DCE EISA SCSI Caching Ctlr**	$228
Trantor348 Parallel Port to SCSI	$149

VLB/PCI CONTROLLERS

IDE

Mustang IDE-IO VLB/PCI	**$22/33**
MustangP IDE w/Fast IO w/OS2 Drivers	**$49**
MustangP 420 w/512k IDE/IO	**$106**
MustangW 2008 2HD/4FD/2S/1P/2.88	**$44**
MustangW 2018 2HD/4FD /2S(16550)/1P/2.88	**$50**
DTC 2277 IDE Caching	$105
DTC 2278 IDE/IO	$29
Promise DC-4030 4HD/2FD Caching	**$115**

SCSI

DTC 3270 SCSI I	**$109**
BusLogic BT445S Fast SCSI-II	$200
UltraStor 34F SCSI II 32k Card/Kit	$272/296
AMI SCSI II Caching w/wo pwrpk	$373/410
ADAPTEC 2842 SCSI II Kit	**$240**
BusLogic KT946S SCSI-2 PCI Kit	$269
Adaptec 2940 PCI Kit	**$284**
National SCSI PCI Controller	$86

ESDI Controllers

Ultra 12F	$167
Ultra 12C 1/4MB	$270/386

Cases - Power Supplies - KeyBoards - Mice

ROADRUNNER SERIES

Baby Desk/Mini Tower w/PS	$43/39
Medium Tower w/PS Compact/Regular	$47/63
Full Tower(230W)/Big Tower(300W)	$72/170
Rack Mount W/PS	$290

DIAMOND SERIES (For Black add $5)

Baby Desk/Mini Tower w/PS	$71
Medium Tower Slim/Thick w/PS	$81/93
Full Tower w/PS	$103
File Server w/ 400W PS, 3 Fans 12 F/HDD	$371

External HDD/CD-ROM Cases

1HH w/PS 3.5"/5.25"	$65/73
1FH(2HH)/2FH(3HH) w/PS	$91/132
Removable IDE Chasis & Carrier	$37
SCSI Cables Int/Ext	$10/11

For Un-Interruptible Power Supplies see UPS's in Networking Section

KEYBOARDS AND MICE

Regular/Spill-Resistant 101	$16/17
MaxiSwitch/KeyTronic	$24/27
Small 11.5" 88 Keys/BLACK 101	$31
Russian Keyboard	$20
Japanese Keyboard, 106 Keys	$59
SEJIN J-Mouse (mouse under 'J' Key)	$95

Also line of European/Arabic KBs

S-Mouse/TBall	$8/20
LogiTech Ser/Bus bulk	$17/39
LogiTech Mouseman Cordless	$82
Microsoft white box S/B	$24/54
BLACK SERIAL	**$16**

POWER SUPPLIES

PS2 200/230/300W	$34/40/51
PS2 200W GREEN PC	**$44**
Full Tower 230/300/400W	$49/63/126

MASS STORAGE PRODUCTS

FLOPPY DRIVES

YE Data 1.2/1.44MB	**$43/35**
Teac 1.2/1.44MB	**$49/38**
Teac Dual Floppy 1.2 + 1.44 MB	**$102**
Teac 2.88 MB	**$99**

FLOPTICALS

IOMEGA 21MB w/1 Disk, Cable	$419
YE-DATA 21MB w/5 Disks	$392

HARD DRIVES

2.5" NOTEBOOK DRIVES

QUN 127 /256MB 16msec	$225/339

IDE

(Hard drive prices change often-please call)

Dae Young 120 MB (when available)	**$145**
SEAGATE 130MB IDE(WHEN AVAILABLE)	$172
CON/QTM 170MB 17 msec	$179/174
CON 210 14msec	**$173**
WD 212 12msec	$NA
CON/WD 250MB 14msec	$222
QTM 270/MXT 245MB 15ms.	**$223/232**
WD 340/MXT 340MB 12/14 ms	$254/219
CON/QTM 340MB	$242
CON 420MB	**$226**
WD 425MB 13msec	$237
QTM 540MB 11msec	**$317**
MXTR/WD 540 12msec	$304/339
MXTR 540 8.5 msec	**$355**
CON 540MB 12msec	$299
CON 1.0 GB	$576
MICROPOLIS 1/1.8GB 10ms	$759/965

SCSI - 3.5"

QTM 42MB SCSI	$69
CON/QTM 170MB 17msec	$189
CON 212MB 12 msec	$202
MXTR 213	$202
MXT 245/QTM 240MB Fast	$249/239
MXT 290	$256
MXT 340MB 15 msec	$267
CON 340MB 13msec	$268
QUN 540MB FAST	**$338**
MXT 540MB/CON 540 8/12 ms	**$423/434**
QTM 1.4 GB 10msec 5 year	**$760**
DEC 1.07GB DSP3107 9ms	$757
DEC 1.6GB DSP3160 9ms	$986
Quatum 1.08 GB	**$655**
MICROPOLIS 1/1.8GB 10ms	$759/965
HP1.2GB 10.5msec	$779
ST1.2GB ST31200N 9 msec	**$710**
Quantum 1800s 1.8GB	**$990**
Quantum 2.1 GB	$1059
ST12400N ST2.1GB 9MS	$1439
DEC 2.1GB DSP3210 9ms	$1259

SCSI - 5.25"

DEC 3.0GB DSP5300	$2046
DEC 3.5GB DSP 5350	$2312
DEC 4.0GB DSP 5400	$2488

SUPER HARD DRIVES

Seagate Barracuda 3.5" HH (8 msec avg. seek, 4.17 msec lat., 7200 RPM) ST11950N/ST12550N 1.7/2.5 GB	$1535/1787

FLASH CARD HARD DRIVE

ST 75A 1.8" 5.2MB IDE<1.5MS	$484
ST 710/720A 1.8" 10.4/20.9MB	$888/1177
ST 740A 1.8" 41.9MB IDE<1.5ms	$2068

EXTERNAL HRD. DRV. SUBSYSTEM

FOR EXT. HARD DRIVE,	ADD $99

TAPE DRIVES

(<500MB TAPE-BACKUPs)

Colorado 120 / 250MB	**$99/149**
Colorado KE-10 External kit with card	**$105**
Colorado External port card	**$37**
FC-10 high perf card	**$85**
Colorado Trakker 250MB	**$329**
Archive 250MB w/QIC,150MB/min,1"H	**$146**
Archive Viper 250MB hh SCSI I/E	**$335/425**

(>500MB for PC / SERVER)

Viper 525MB hh SCSI Int/Ext 6MB/sec	$440/530
Mountain 2/4GB Filesafe Int Dat 4mm	$1629/1959
Archive 4320 NT 2.0GB DAT 3.5"	$829
Archive 4324NT 4.0GB TURBO DAT 3.5"	$1075
Colorado 2.4 / 4.0 GB Qic 5.25	$929/1155
HP 2GB DAT 4mm Int/Ext	$879/979
HP 4-8GB DAT 4mm Int/Ext	$1080/1150
WANGDAT 3100 2.0GB 4mm Int/Ext	$902/1020
WANGDAT 3200 4-8GB 4mm Int/Ext	$924/1035
EXABYTE 750MB HH MINI Int/Ext	$692/860
EXABYTE 8205 5GB HH Int/Ext	$1595/1695
EXABYTE 8505 10GB HH Int/Ext	$2339/2505

(above drives require special contr & soft drivers)

TAPE BACKUP DRIVERS

Novaback for DOS//OS/2	$65
Novanet Multiuser NLM	$279
ARC Serve Solo	$175
SYTOS for DOS/NOVELL, GEN	$120
Conner Backup Exec for Dos/Win v3.3	$79
Conner Backup Exec for Netware v3.1	$259

MAG/OPTICAL (Rewritable)

TEAC 128MB 3.5" Int/Ext	$625/729
PinnacleTahoe 130 portable 3.5"Opti w/inter.	$999
IBM 127MB 3.5" Int/Ext	$833/943
Panasonic LF-7010 1GB 5.25	$2799
HP 1.3GB 5.25" SCSI-2 EXT	$2799
MAXOPTIC 1GB Tahiti IIM 35msec	$2260

REMOVABLE DRIVES

Syquest 44MB Dr.	$249
......W/Ext Case, Cables, Cart, Cont.	$379
Syquest 88/105MB Dr.	$308/389
Bernoulli 44/99 Insider	$907/840
IDE: Upto 1GB removable kits	$39
SCSI: Upto 1GB Removable Kits	$138

DISKETTES & CARTRIDGES

Floppy 1.44 Bulk 20+/100+/500+	**$.49/.44/.39**
Floppy 1.2 Bulk	**$.44**
Tape DC2120 250MB..Formatted	**$16**
Tape DC 6250 5.25", 1/4" Cartridge	$25
Tape DC 6525 5.25", 1/4" Cartridge	$30
TK50 for DECs	$24
DAT 4mm 90 mtr HP/OEM	$20/14
DAT 8mm 112 mtr.	$14
Syquest 44/88/105MB Cart.	$62/94/85
Bernoulli 44MB/90MB 3Pk	$289/298/264
Mag-Opt 600MB/650MB 5.25" Rewrite	$86/86
Mag-Opt 1.2/1.3 GB Rewrite	$124/124
Mag-Opt 600/650MB WriteOnce.	$86/86
Mag-Opt 1.2/1.3GB WriteOnce	$128/128
Mag-Opt 128MB 3.5"	$58
Mag-Opt 650/1.3GB WORM 5.25"	$160/193

VIDEO ADAPTERS & MONITORS

ISA/EISA ADAPTERS

MGP	$13
VGA 256k	$28
Trident 512K/1MB	$39/58
Tseng 1MB	$73
Mustang 1MB Window Accel	$58
Diamond Stealth 24	$137
Orchid Fahrenheit 1MB	$137
Hercules Dynamite Pro 1/2MB	165/204
Hercules Graphite Pro 1/2MB	$274/418
ATI Ultra Grpx 1MB w/Mouse	$214
ATI Ultra 8514 1 MB VRAM(Dual mon. cap.)	$176
ATI Ultra Pro 2MB (no mouse port)	$294
Genoa 7900 w/1MB	$95**
Genoa 8560 w/ 1MB	$171**
Genoa 6200	$36**
ATI Ultra Pro EISA 2MB	$316
AMI Fast View EISA VGA Graphics w/1MB	$221

VLB/PCI ADAPTERS

(wm = winmark ver2.5)

MustangVT Trident 1/2MB	**$69/114**
MustangVC Cirrus logic 5428 1/2MB	**$79/126**
MustangVS S3-805 1/2MB	**$89/134**
Spider 32 1MB/2MB,20 WM	**$95/139**
Spider 32 Plus 1MB	**$98**
Spider BlkWidow 1/2MB 54 WM	**$134/197**
DIAMOND Stealth 24vlb 1MB	**$139**
DIAMOND Stealth pro 1/2MB vram,36wm.	**$255/316**
DIAMOND Viper 2MB,9000,50wm	**$322**
ORCHID Fahrenheit S3-805,1/2MB	**$135/193**
ORCHID Celsius 1/2MB	$216/266
ORCHID Kelvin 1/2MB	$149/194
Hercules Dynamite Pro 1/2MB	**172/225**
Hercules Graphite Pro 1/2MB	$274/418
ATI Ultra Pro 1MB DRAM	$137
ATI Ultra Pro 2MB, 26wm	$305
Cirrus Logic 5428 PCI 1/2MB	$126/171
Orchid Kelvin PCI 1/2MB	$149/194
Spider 64 PCI 1/4MB	$171/233
ATI VRAM 2MB PCI	$249
DIAMOND VIPER 2MB PCI	$338

CAD SPECIALITY ADAPTERS

NUMBER NINE - #9GXI/GXE

L10 ISA or VLB Retail/Bulk	$249/236
L11 ISA or VLB Retail/Bulk	$359/339
L12ISA&VLBRetail/Bulk	$420/406
L14 ISA&VLB Retail/Bulk	$649/599
L20/21 lite	$515/679
64 1MB/2MB....PCI or VLB	$185/255
64 PRO 2MB/4MB	$365/549

MATROX

MGA-VLB 2/Plus	$429/479
MGA-VLB 4/200	$865
MGA-IMP 3A&V	$715
MGA-PRO 4.5V/4.5+z buffer	$1119/1399
MB memory upgrade	$209
MGA-PCI 2/2Plus	$385/429
MGA-PCI 4/4-200	$744/968

METHEUS CORPORATION

Premier 928 VL2(1MB)/4(2MB)	$324/559
Premier 928 ISA 1M/2M/4M	$297/422/725
MODULE 1MB Memory	$119
1.104 Plus 256 Hz, MultiDisplay	$1295

(We do not have the high end CAD adapters and monitors on display and carry only a few in stock - these are on Just-In-Time inventory basis - please place orders in advance-the prices in parenthesis are on a cash basis only)

9" - 14" MONITORS

MONO

Mono 14" amber/white	**$79**
Mono 9" VGA/14" SVGA	**$104/91**

VGA/SVGA

SVGA 14" 1024 x 768 .39	**$189**
SVGA 14" 1024 x 768 .28 Int.	**$216**
SVGA 14" 1024 x 768 .28 NI	**$227**
Black SVGA 1024 x .28 I/NI	$270/282
Kanaka 14" Int/NI w/Hitachi Tube	**$233/256**
CTX 14" 1024 x 768 .28 Int.	**$247**
CTX 14" 1024 x 768 .28 NI	**$260**

CAD MONITORS

Miscellaneous

KFC15".28 1280x1024NI wo/w Digital	**$327/385**
KFC 17" .26 1280x1024 NI	**$735**
Sony 1604s OEM	$785
Mitac 17" .28 1280x NI	$649
Mitac 17" .26 1600x NI Energy* 3yr warnty	**$709**
Mitsubishi 15FS/17FS DiamScan	$498/1039
MAGNVX 15".28 1280XNI MPR2 digdisply	$355
MAGNVX20CM64 20", 1280, .31.	($1110) $1150

NANAO

F550i 17", .28,1024NI MPR2	($875)$925
F550iw17",.281280NI MPR2	($962) $1012
T560i 17",.25 1280NI, MPR2	($1241) $1305
T560iw,.26 1280NI,MPR2	($1482)$1556
T660i 20",.30 1280NI MPR2	($2135) $2215
F760iw21".31,1280NI,MPR2	($1969) $2049

NSA-Hitachi

CM1797 17".28.1280NI,MPRII	($975)$1099
CM2095 20" 1280 Anti Glare	($1239) $1295
CM2087 20" 1280 72Hz Mic.	($1499) $1555
CM2187-515 21" .28 1280NI	($1729) $1795
CM 2188 21" .28 1280NI	($1950)$1989

Hitachi America - ACCUVUE

PS-20,.31dpi 1600x NI	($1555)$1618
PS-21,.28dpi 1600xNI	($2029)$2099
PS-21A,.28dpi 1600xNI	($2295)$2389
PS-21.28dpi 1600xNI Mic.	($2354) $2449

Sony

CPD1430s 14" 1024NI .25	($539)$555
CPD1730 OEM 1024NI .25	($828)$859
CPD 1730 Original 1024NI,.25	($970)$998
GDM17SE 17" 1600NI .25	($975)$1009
GDM20se 20"	($1929) $1999

Nokia

17" 447B Trin.25dpi, 1280x	($927)$975
21"445M.26,1280NI	($1978)$2029
21"445X.26,1600NI	($2566)$2615

Sampo

Sampo KDM1767 17" .28	($675)$719
Sampo 1777 17" .28 Microp.	($755)$795
Sampo 2055 20" .31	($1040)$1075
Sampo KDM2077 20" NI 1280 .31	($1460)$1520

NEC

CDR-400/500	$415/$465
CDR-600/900	$495/$965
3V/4FGE	$485/($635)$666
5FGE/FGP17".28,	($1007) $1049/($1125) $1165
6FGP21",.28,1280NI	($2025)$2095

MAG

LX1564 OEM15" .28, 1280NI	**$399**
MX15F 15"MPR II	($459) $477
DX15F 15"	$399
DX 17F 17" .26 1280x	($699)725
MX17F,17".26,1280NI,Mic Org	($815) $878

Prices given in bold are usual stock items, prices not in bold are special order items and require a 20% deposit, are not returnable, and take 2-3 days lead time.

CASH COUPONS

MONITORS

MITAC 17"
.26 1600 NI
ENERGYSTAR
3 YEAR WARNTY
$679

MONITORS

KFC/KANAKA
15" .28 1280
$315

COMMUNICATIONS

2400MODEM..$24
96/24 F/M..........$35
14.4 INT F/M.....$69.99

COMMUNICATIONS

US ROBOTICS
14.4 F/M Int/Ext
5 YEAR/16550 UART
$105/126
(limited time, one per customer)

MOTHERBOARDS

486 DX VLB W/256K
DX-33 CYRIX...$220
66 AMD/INTEL.$340/360
100DX-4 INTEL.....$663

MOTHERBOARDS

PENTIUM
Capricorn series
60 Mhz PCI..$882
66 Mhz PCI/EISA.$1,146
90 Mhz PCI........$1,173

ADAPTERS

CONTROLLERS
IO W/16550...$29
SCSI w/DRIVERS.....$49
ADAPTEC VLB SCSI..$229
ADAPTEC PCI SCSI...$279

ADAPTERS

VLB / PCI
CL 5428 1MB........$79
HERCULES DYNA 1MB....$165
DIAMOND VIPER 2MB....$309
CL 5428 PCI 1MB............$120
ATI PCI 2MB................$239

Micro MARKETPLACE

MicroMARKETPLACE

MULTI MEDIA

CD-ROMs

IDE TYPE CD-ROMs

CD-ROM-#1-of-the-Month
Mitsumi Kit 350msec, 150 KB/S.........$79

Panasonic 562 DblSpd.320ms, 300kb/sec.	**$147**
Mitsumi Dbl-Spd 250ms,300kb/sec	**$136**

Super Multi-Media Complete Kit on Sale!
Mitsumi CD-ROM, 150KB/sec, 350ms
8 bit Sound Blaster Compatible Card (for Win)
Quickshot Warrior joystick
Shielded PC spealers
Deluxe model microphone
Award winning Apogee sound-supported games; all for.................$138!!!

SCSI CD-ROMs

NEC 3X 510CDR Ext 195ms,450KB/sec.	**$434**
NEC 3XP Portable 250ms,450KB/sec.	$460

CD-ROM-#2-of-the-Month
NEC 3X CDR-510 Multispin,
195ms,450KBS....**$339**

TOSHIBA 3401B/E 200ms, 300kb/s I/E.	**$272/356**
TOSHIBA 4101 B/E 235ms,300Kb/sec Int.	$210
Texel 3028/5028 240ms, 335kb/s I/E.	**$266**/350
SONY CDV561, 295ms, 300kb/sec.	$286
Future Domain SCSI CD-ROM Kit.	$69

AUDIO CARDS & MPC KITS

Hyena Snd Bister Comp. 8bit Sound Card.	**$39**
Hyena w/ Speaker, Joystck, mcrphn, game.	**$50**

MEDIA VISION

Pro Audio 16 Basic.	**$58**
Pro Audio Spectrum 16 w/scsi.	**$97**
Pro Audio Studio. 16/Power Pack.	$199/69
Fusion Double CD16 Kit Int/Ext.	$475/495
Pro 16 Multi-Media System/II.	$609/764
Pro Movie Spectrum/Studio II.	$279/309

CREATIVE LABS

Sound Blaster Deluxe 8bit.	$67
Discovery 8/16 Upgd. Kit.	$369/429
Edutainment 8/16 Upgd. Kit.	439/489
SoundBlaster 16 Basic/SCSI 2.	**$102/144**
SoundBlaster 16 ASP SCSI/MCD.	**$202/171**
Sound Blaster Voice Editor.	$55
Wave/Video Blaster.	$179/305

MISC MULTI-MEDIA PRODUCTS

Encyl 1:Encyl,Animals,World/US Atlas.	**$39**
Educational 1 plus Family health.	**$68**
Joystick.	**$15**
Mouse Systems Joystick.	$25
Logitech Fotoman Digital Camera for PC.	$465
Logitech SoundMan 16.	$109
Intel Smart Video Recorder.	$520
Cardinal Tech Digtl Sound Pro 16/Plu.	$145/186
Video Logic Captivator Kit win3.1.	$369
Midi Mate/CDPC XL.	$49/1059

PLOTTERS, DIGITIZERS, SCANNERS & PRINTERS

PLOTTERS

HOUSTON INSTRUMENTS

V50 INKJET A-C,2MB BUFFER.	$1298
HiPlot 7100 A-D 8 pen,LCD display.	$2575
HiPlot 7200 A-E 8 pen,LCD display.	$3395
DMP-162R A-E, 8 Pen, Roll Feed.	$3958

DIGITIZERS

SUMMAGRAPHICS

III 12x12 w/16btn or 4bt & Pen.	$313
III 12x18 w/16btn or 4bt & Pen.	$539

KURTA

XLP 12x12 w/4btn & Pen.	$225
XLP 12x18 w/16btn or 4btn & Pen.	$429
XGT 12x12 w/4Btn.	$322
XLC 36x48 w/16btn or 4btn&pen.	$1520

CALCOMP

CALCOMP 12 X 12/12 x 18.	$299/629
CALCOMP 18 X 24.	$1275

SCANNERS

LOGITECH (HAND-HELD)

SCANMAN-COLOR/w OmniPage.	$392
SCANMAN 256GS wo/ w OmniPage.	$155/195
SCANMAN 32GS w/ OmniPage.	$128
Power Page Slide.	$479

MICROTEK

SCANMAKER II/IIXE 600dpi w/OCR.	$659/915
Scan-in-Dex Business card scanner.	$275
Scanmaker IIG/IISP.	$495/815

MUSTEK (Hand-held)

ScanMagic256,400dpiw/perceive.	$109
ScanMagic Color,400dpi,256 grays w/perc.	$215
GrayArtist,800dpi,256 grays w/perc.	$159
Colorartist Pro,800dpi,256&colr w/per.	$315

MUSTEK (Flatbed)

Paragon 600(dpi)24 bitclr,Photoshop.	$629
Paragon1200(dpi)24 bitclr,Photoshop.	$998

UMAX Technologies

UC 630 PC,1200dpi max,24bit /256gray.	$719
UC840,1600dpi max,16.8 million clrs.	$949
UC1260,2400dpi max,16.8 million clrs.	$1225
UC1200SE,2400dpi max.,30 bitclrs.	$2634

Hewlett Packard

HP IIP Grayscale scanner.	$515
HP IICX Color scanner.	$998

EPSON

ActionScning 300/ES 800C.	$839/1329

Miscellaneous

Mouse Systems Gray/Color hand held.	$175/125
Info 3gs 300dpi sheet fed.	$375
Info SF-6C 600dpi sheet fed.	$450
LeoScan 610 sheet feed,300dpi/256 gray.	$599
Westbrook File Majic OCR for scanners.	$285
Relysis 9600 800dpi color flatbed.	$2995
Tamarack 6000/8000C.	$729/853
Fujitsu M3096 11.7x17".	$4500

PRINTERS

Miscellaneous

Star Micrnix NX1001 9 Pin.120/220V.	$134/144
Star Micronix 220v quantity of 100 only.	$135
IGOR 132 9Pin Wide 220V (Cyri..).in stock..........with any purchase.	$110

EPSON

Action 2250 9 pin,50sheet,240cps.	$133
LQ570+ 24 pin wide, 269 cps, 11 fonts.	$249
LQ 1070+ 24 pin Wide,252cps,11fts.	$369
LQ 1170 24Pin ,2 resident fonts.	$609
Stylus 300 Inkjet 360dpi,150cps.	$221
Stylus 800 Inkjet 360dpi,150cps,100sht.	$283
ActionLaser 1500 300dpi,6ppm,1mb.	$655

CANON

BJ 200e/230,360dpi,49k,7fnts,4ppm	$295/395
BJ10SX,110cps,360dpi,**Portable**.	$241
BJC 600 Color,240cps,360dpi,100shtfd.	$579
BJC 820 Color,240cps,4ppm,1MB.	$1467

OKIDATA

OL 380 dotmatrix,24Pin,23K.	$217
OL400e/410elaser 4ppm, 300dpi.	$499/639
OL810, 8ppm, 300dpi.	$885
OL830 Plus/850, 8ppm w/ 2MB ps.	$1055/1165
OKI ML520 9 pin 64K.	$359
OKI ML590/591 24 pin..auto form.	$417/561

PANASONIC

KX-P2124, N-Carr, 320cps, 360dpi, 12fnts.	$318
KX-P2624.	$381
KX-P1624, W-Carr, 192cps, 360dpi, 14fnts.	$383
KX-P4410,5ppm,300dpi,28fnts,512k.	$529
KX-P4450i/4430.	$967/655

CITIZEN

GSX 145 24Pin wide,160cps,360dpi.	$349
GSX200 9pin,Narr/wide.	$168/289
GSX220 24pin/CTZ projectII 3ppm.	$179/279
GSX230 24 pin.8 fonts, 270cps.	$221
(color option for Citizen 80 col printers.	*$45)*
GSX240 24 pin 300cps, 13 fonts.	$281
Notebooks CTZPN48/CTZNP-IBM.	$284/326

HEWLETT PACKARD

Deskjet 520 300dpi,120cps,16k.	$289
Deskjet 500C Color 300dpi,167cps 16k.	$385
Deskjet 560C Color,3ppm,300dpi,80k.	$553
Deskjet 1200C/ps Color2MB.	$1375/2079
HP 4+/4P/4SI/4L.	$1375/935/2835/637
4M+/4ML/4MP/4 SIMX.	$1875/971/1350/4185

NEC

Pinwriter3300 24pin wide,360dpi,80K.	$326
Pinwriter6200 24pin narrow,360dpi,80k.	$399
Pinwriter9300 24pin wide.360dpi 333draft.	$839
Silentwriter superscript610,6ppm,256k.	$471
Silentwriter1097 600dpi,7mb.	$1365

FUJITSU

10/10W Laser,10ppm,1/2mb 14/35fts.	$830/942

All printers: Cash basis only and come with the Original Manufacturer's warranty. Please call for lead time. No returns on any printer purchase with this pricing.

MEMORIES, MATH-COs & CPUs

MEMORIES for IBMs

SIMMs

256 x 9 (3 chip)-70NS.	$12
1M x 9 (3 chip)-70 Major brand.	**$39**
1M x 9 (3 chip)-70NS IBM original.	**$37**
1Mx9(2 chip)-70NS No parity.	**$34**
1M x 9 (9 chip)-70NSMajor brand.	**$42**
4M x 9 (3 chip)-70NS.	**$138**
4M x 9 (9 chip)-70NS.	**$148**
1M x 9 (3 chip)-60 Major brand.	$41
4M x 9 (9 chip)-60NS.	$159

ESIMMs(72 Pin)

256x36-70NS.	$55
512x36-70NS.	$95
1x36-70NS.	**$155**
2x36-70NS.	**$314**
4x36-70NS.	**$616**
1x36-60NS.	$158
2x36-60NS.	$329
4x36-60NS.	$635

SIPPS

256x9 (3 chip)-70NS.	$14
1x9 (3 chip)-70NS.	$43
1x9 (3 chip)-60NS.	$46

DRAMs

1x1-70/80NS.	$5.50/5.25
256x1-70/80NS.	$1.75/1.60
256x4-70/60NS.	$5.75/5.50

MEMORIES for MACs

MACINTOSH

1x2chip-70/80NS.	$35/33
1x8chip 70/80NS.	$40/37
2x8chip 70/80.	$85/80
4x8chip-60/70/80NS.	$137/126/125
16x8chip-70NS.	CALL

APPLE UPGRADES

Centras & Quadra 600 series

256x32-70NS.	$39
512x32-70NS.	$78
1x32-70/80NS.	$136/133
2x32-70NS.	$278
4x32-70NS.	$510
8x32-70NS.	$1175

QUADRA 800 SERIES

512x32-60NS.	$78
1x32-60NS.	$137
2x32-60NS.	$275
4x32-60NS.	$645
8x32-60NS.	$1285

CACHE RAMs

32x8-20.	$6.90
64x4-20.	$7.50
8x8-20.	$3.70
16x4-20.	$3.85
64x1-20.	$6.70
128x8-25.	$38
32x8-15.	$7.90
64x4-15.	$9.50
8x8-15.	$4.10
16x4-15.	$4.75
64x1-15.	$8.45
128x8-25.	$3

CPUs & CPU FANS

INTEL

386 DX33.	$40
486 SX25/33.	**$70/90**
486 DX 33.	**$245**
486 DX 50.	**$300**
486 DX2 50.	**$262**
486 DX2 66.	**$282**
486 DX-4 75/100.	$505/615
Pentium 60MHz.	$535
Pentium 66MHz.	$692
Pentium 90MHz.	$761

AMD

386 DX 33/40.	$47/48
486 DX-33.	**$152**
486 DX 40.	**$166**
486 DX2 50.	**$205**
486 DX2 66.	**$257**

CYRIX/TI

486 DLC 33/40.	$62/68
486 DX 33/40.	**$136/160**
486 DX2-50/DX50.	**$175/255**

CPU Fans

486 heat sink and fan.	**$7.95**
Pentium 60,66/90.	**$12/15**

MATH-COPROCESSORS

INTEL

80387 SX 16/20/25.	$45/64/75
80387 DX 16/20/25/33.	$35/40/45/80

Overdrives - call for latest prices

IIT

3C87SX-16/20/25.	$39
3C87SX-33.	$39
3C87DX-25/33/40.	$39

CYRIX

83S87SX 25.	$39
83S87SX 33.	$39
83D87-33.	$41
83D87-40.	$41

WEITEK

4167-25.	$265
4167-33.	$425

LASER EXT. MEMORIES

HEWLETT-PACKARD

HP IIP, IIP+,III,IIID,IIIP ..1/2/3/4MB.	$75/114/155195
HP II, IID ....2/4MB.	$124/199
HP IIISI ....1/4MB.	$76/204
HP IV ....4/8MB.	$165/365
Deskjet 500, 500C, 550C.....256K.	$88

PANASONIC

KXP 4410/20/30 ......1/2/3/4MB.	$98/148/175/215
KXP 4450 1MB.	$137
KXP 4455 ....2MB.	$164

OKIDATA

OKI 400 ....1/2MB.	$98/119
OKI 800/820 ....2/4MB.	$123/193
OKI 810 ....1/2MB.	$111/189

Special Terms and Conditions for this Section: CPU and Memory prices change on a daily basis; please call for the latest prices. These products when bought without systems may come with a shorter warranty - please inquire. We do not stock many of the above products - please call for availability.

SOFTWARES

For Networking, Communications, Tape Storage Drivers, Networking Drivers, Multi-Media and Speciality Softwares also look in the corresponding sections.

UTILITIES

Norton Utilities V 7.0/Anti-Virus v2.1.	$116/89
QEMM 386 V7.0.	$69
AfterDark V2.0 WIN.	$29
PC Tools V 8.0A.	$57
Auto-Doubler/Disk-Doubler.	$68/61
LapLink V5.0 FOR NETWARE.	$74
MickyMouse/StarTrek Screen Saver.	$39

DESKTOP PUBLISHING & GRAPHICS

Corel Draw V4.0/UPGRADE.	$383/218
Pagemaker/WIN V5.0.	$554
Harvard Graphics For Windows.	$248
Norton Desktop WIN V2.2.	$115
Micrographx Graphics Works.	$158

DATABASES

Accesss for Windows.	$145
CA-Clipper V5.2.	$512
DBASE IV V2.0.	$513
FoxPro For Win/DOS 2.5 Upgrade.	$300/305
FoxPro LAN.	$call
Paradox V4.0/WIN.	$524/145
Q & A 4.0.	$243
Superbase 2.0 WIN.	$345
LOTUS SMARTSUITE.	$448
Gupta SQL router/SQL server.	$166
Gupta SQL for DOS.	$2597
Gupta SQL gateway for netware.	$3252

ACCOUNTING/BUSINESS

CA-Accpac BPI Integrated.	$148
CA-Acc. Simply Accounting DOS.	$79
DAC Easy Accounting/Payroll 4.3.	$94
Works for WIN 2.0.	$129
MS Project 3.0 for WIN.	$425
MS Office 4.2 (Word,Excel,Pwrpoint,Mail).	$475

SPREADSHEETS

LOTUS WORK V3.0.	$99
MS Excel V5.0.	$292
MS Works for WIN.	$123
Quattro Pro V 5.0 WIN/DOS.	$54

WORD PROCESSING AND GRAPHICS

AMI Pro 3.1.	$240
Grammatik.	$73
Professional Write V 2.2.	$159
MS Word 6.0 for DOS/WIN.	$305/299
Word Perfect 6.0 for DOS/WIN.	$296/294
WordStar 7.0.	$264

COMMUNICATIONS

Procomm Plus 2.01/WIN.	$70 /97
WinFax Pro V 3.0 for WIN.	$99
Norton PC Anywhere 4.5 Host/Rem.	$65/86
CrossTalk for WIN.	$129

PROGRAMMING LANGUAGES & OPERATING SYSTEMS

M.S. DOS 6.2/UPGRADE.	**$48**
M.S. OEM Windows 3.11 for PC system.	**$56**
M.S. Windows V 3.11 Original.	**$89**
DESQView V1.1.	$163
Windows NT 3.1 /UPGRADE.	$314/278

ACCPAC plus AUTHORIZED DEALER

Prices given in bold are usual stock items, prices not in bold are special order items and require a 20% deposit, are not returnable, and take 2-3 days lead time.

CASH COUPONS

HARD DRIVES
CONNER
420IDE
$ 2 2 2

HARD DRIVES
MAXTOR
540 IDE/SCSI
8.5 MSEC
$335/409

HARD DRIVES
Conner
1 GB
IDE/SCSI
$559/625

HARD DRIVES
QUANTUM 2.1 GB
10MSEC/5YEARWARNTY
$1,049

NETWORKING

16BIT NE2000 COMP COAX/TP.	$29
16 BIT NE2000COMP COMBO.	$39
INTEL 10BT FLASH.	$99
8 PORT TP HUB W/AUI.	$159
16 PORT TP HUB W/AUI.	$359

MULTIMEDIA

8BIT SOUND C/KIT.	$39/59
MITSUMI 1X CD ROM.	$79
MITSUMI 2X INT.	$130
TOSHIBA 2X 3401 INT.	$261
NEC 510-CDR 3X.	$334

COMMUNICATIONS

FAX-MODEMs

PONY 902Z 96/24 Fax (Send)/Mod Int.	**$27**
PONY 992Z 96/24 Fax/Modem	**$40**
PONY 992NZ 96/24 F/M, v. 42 bis Enh	**$55**
PONY 1414IZ 14.4 F/M,.32/.42 w/Bitfax Int.	**$73**
Pony 14.4 F/M .32/.42 Int w/Voice prm	$126
PONY 992PZ Pocket 96/24 F/M,.32/.42	$63
PONY 1414PZ Pocket 144 F/M, v.32, v.42	$184
PONY 992MG PCMCIA 96/24 F/M v. 42	$132
PONY 1414MG PCMCIA144/144 F/M v.42	$244

AT&T Paradyne

DataPort 14.4 Fax V.32bis External	$175
Comsphere 19.2/14.4 Fax v.42bis Ext	$575
Keep in Touch PCMCIA 14.4 S/R Internal	$299

US ROBOTICS

9600 Sport Mod/fax V.32 V.42bis I/E	$110/133
14,4 Sport Mod V.32bis V.42bis I/E	$113/135
14,4 Sport Mod/Fax V.32b V.42b I/E	**$117/141**
14,4 Mac&FAX Ext. Mod/fax	$165
14,400 HST Courier Dual V.32bis	$742
Modem Sharing Single/Dual Kit	$548/964
World Port PCMCIA 14.4 Mod/fax Int	$305

INTEL

14.4 Fax/Modem Winfax Int./Ext	**$119/138**
Satisfaction 200/300Fax Int	136/125
Satisfaction 400 14.4 S/RFax Int/Ext	$295/329
14.4 PCMCIA S/R Internal	$259
Net SatisFAXtion v2.5 20 User	$745
Wireless modem for lan based server	$755

HAYES

Accura 14.4 F/M .32/.42 Int/Ext	$155/165
Optima 14.4 F/M .42 Int/Ext	$372/372
Optima 14.4 F/M PCMCIA	$285
Optima 14.4 F/M Pocket	$335

ZYXEL

U-1496B 16.8/14,4 VoiceFax SW,S/R Int	$318
U-1496B+19.2/14,4 Voice Fax SW,S/R Int	$429
U-1496E 16.8/14.4 VFax SW,S/R LED Ext	$298
U-1496E+ 19.2/14.4VFaxSW,S/R LED Ext	$419
U-1496+ 19.2/14.4VFaxSW,S/R LCD Ext	$625
U-1496+19.2/14.4 S/R LCD MAC Ext	$639
U-1496E+ 19.2/14.4 S/R LED MAC Ext	$429

PRACTICAL PERIPHERALS

14.4 Fax/Modem S/R Internal	$143
14.4 Fax/Modem S/R External	$154

Miscellaneous

National Tyin 2000 96/24 Int. w/voice	$125
Complete Comm EZ 96/24 Int w/voice	$150
Supra 14.4 F/M Int/Ext	$125/135
Supra Mac 14.4 Ext	$159
Megahertz 14.4 PCMCIA Type3	$298
Motorola 14.4 Int/Ext	$

WHITE PAPER FAX

Converts any Laser Printer to a White Paper Fax Machine; avoid use of expensive ribbons. 20 page Memory. Ideal for heavy through-put.

.......$249

NETWORKING PRODUCTS & SERVICES

ETHERNET Adaptors

NE 2000 Plus Comp 16bit Coax/10BT	**$32/32**
NE2000 Plus Comp Combo soft&hard config	**$40**
D-Link 16 Bit,SoftConfig. 10BT 1/6 Pack	$70/377
Intel EtherExpress 16/5pk/20pk	**$104/479/1815**
Intel EtherExpress 16 MCA C/16 MCA TP	$171
Intel EtherExpress 32 EISA/Flash 32C	$419/239
Intel EtherExpFlas TP/C 5/20pk	$112/585/2059
SMC Ethcard 16 UltCx/6 Pk/24pk	$109/574/2149
SMCEthcard+IA for MCA/TP	$179
SMCEthcard+Elite16 Cx/TP1/6/24	$119/615/2289
3 Com 503 Etherlink II 16 Bit Coax/TP	**$159/169**
3 Com 507 Ethlink II 16 Bit Coax/TP	**$289/299**
3 Com 509 Ethlink III Coax/5Pk	$119/505
3 Com 509 Ethlink III Combo/5/20	$145/559/2199
3 Com 529/579 EISA Coax/10 BT/5pk	$229/959
EagleNE2000 Plus/5Pk	$89/385
EagleEP2000 Plus/5pk	$92/405
Asante Etherpack2000+ Coax/10 BT	$129
Microdyne NE2000 Plus	$109/94
HP Ethertwist PCLink/6pk	$159/759

ARCNET

16bIT Star/bus Topology-combo	$65
4Port Passive Hub	$15
8 Port Coax stackable Active Hub	$139

ADAPTERS for TOKEN RING

Intel Token Express 16/4 ISA/MCA	$429/469
SMC Token Ring Adapter 16/4	$345
3 Com Tokenlink III 16/4 ISA/EISA	$455/635
IBM Token Ring Adap II	$289

POCKET LAN ADAPTERS for Notebooks

Advanced LAN Net Coax/10BT	$129
XIRCOM PE3 10B2/BT/BC	$274/274/299
XIRCOM 16/4 MBNS Tokenring w/Type 1Bnc	$525
Xircom 16/4 Tokenring w/Type 3Coax	$525
DLINK DE-600 Softconfig. Coax/10BT	$172

PCMCIA ADADAPTERS for PalmTops

DLink DE-650 Coax/TP	$191/195
NATIONAL NE4100 COAX/10 BASE T	$214
XIRCOM Credit Card BNC/RJ-45	$269
XIRCOM Crdit Card Courso	$299
GVC Adapter	$137

CABLES & CONNECTORS

ETHERNET RG58 or RJ45 10BaseT

Readymade w/Connectors 10'/25'/50'	$4/6/9
RJ45 10BT patch cabnles 7'/25'	$4/6
Token Ring patch cable	$23
RG58 Bulk SPOOL	$80
RJ45 10BT 1000' level4/5	$119/130
BNC 50 Ohm Terminators/Crimp-ON/Barrel	$1.49
BNC T-Connectors	$1.99

Concentrators

CeLan 2-Port BNC/AVI Repeater	$235
Ce-Lan 4-Port BNC/AVI Repeater	$445
Allied Telesis 4-Port Repeater 2AVI,2BNC	$750
Allied Telesis,4-Port,8BNC,1AVI	$699
Allied Telesis,8 -Port,8 BNC,1AVI	$785
Allied Telesis-3008 Multi-port 8BNC,1AVI	$1189

We provide Networking Installation and Maintenance Services at good rates

Hubs

CeLan 8 Port 10 BT w/BNC Cascade port	**$168**
CeLan16 Port 10BT w/AUI exp. port	**$385**
CeLan 16 Port 10BT managable	$439
CeLan 16 Port Intelligent w/SNMP	$1019
Allied Telesis 12 Port RJ45,1AUI	$459
Asante 8 Port Hub,8RJ45,1BNC	$249
Asante 12 Ports,12tp,1BNC Thin,1 AUI Thick	$475
Asante 1701 Smart 12Ports/SNMP	$1019
Microdyne 18 port 10 Base T5000 series	$619
D-Link 12 Port 10 BaseT	$399
D-link DE-1500 w/SNMP	$869
D-link K1032 32Port w/SNMP	$1199
Intel EE 12 Port 10 BT Hub Int w/Harmonica	$634
Intel EE 12 Port Hub Int EISA w/Harmonica	$699
SMC 8 Port Concentrator/12 Ports TP	$325/599
SMC Intelligent 16PT UTP	$1129
Synoptics 2800 A 16 Port w/AVI	$699
Synoptics 2804 16 Port w/Fiber Optics	$951
3 Com Link Builder 3C621 12 Port	$419
3 Com Link Builder FMS 24/48 port	$1179/2689

BRIDGES

Allied Telesis local Ethernet Bridge	$1645
3 Com 802C NetBuilder local Ethernet	$3399
3Com 750 NetBuilder Token Ring local	$4714
3Com 5823C NetBuilder Remote	$5319
Synoptics 3323S Ether Local w/AVI	$2353
Synoptics 3522 Token Ring	$5319
Novell Multiprotocol Router v 2.0	$669

PRINTER SHARING

Ethernet Print Servers

INTEL

Ethernet NetPort II for Coax,10BaseT	$385/379
Token Ring NetPort with DB9 Connector	$529
Netport ExpressXL Coax, UTP, 10BaseT	$624

(Conpact design for easy connectivity on on versions of Novell Netware. Comes with either 1S/1P or 2P ports)

OTHERS

Eagle NPE400 Parallel Port RJ-45/Coax (1P)	$364
XIRCOM Pocket Ethernet RJ45/Coax	$305/289

(Allows a Pocket LAN Adapter and a Parallel Printer to be attached to one LPT Port)

DEDICATED PRINTING BASED

Simple AUTO-SWITCHING

2 Computers to 1 printer Electronics	**$24**
4 Computers to 1 printer Electronics	**$38**
2 Computers to 1 Printer Bi-directional S/P	$49/45
4 Computers to 1 Printer Bi-directional S/P	$69/61
*Fax Swithcer 2 Port Fax/Telephone	$85

PRIMAX Advanced Printer Sharing

PrinterNET Transm/Rec. kit (w/25')	$69
PrinterNET Starter kit	$155

(It can connect 16 computers to 6 printers)

ModularLink Transm DB-25(w/25')	$40
ModularLink Receiver Cen	$45
ModularLink Starter Kit	$106

(It can connect up to 16 computers to printer)

COMING SOON... PRIMA NET STARTER KIT & TRANSMITTER/RECEIVER KIT WITH 25' CABLE

NOVELL NETWARE

Ver 3.12 5/10/25/50 User	$613/1429/1935/2523
Ver 3.12 100/250 User	$3783/6667
Ver4.01 5/10 User	$843/1677
Ver4.01 25/50 User	$2355/2971
Ver4 .01 100/250 User	$4701/9143
Ver4 .01 500/1000 User	$15375/27932
Netware Personal 2User kit w/2 coax cards	$179
Netware Lite v1.1 w/Win utilities	$72
Netware Lite v1.1 w/Win Util&Dr. DOS	$90
Dr. DOS 6.0	$72

(Novel's prices are changing frequently, so please call for the latest price changes)

EIECTRONIC MAIL

by CC:MAIL

Platform Packs: *(For connectivity on all LANs and across all LAN Bridges and Gateways. For support of any combination of Server-to-Server, LAN-to-LAN, and Remote Workstation-to-LAN messaging. One Platform pack is required for configuring any system)*

CC:Mail DOS 4.2/Win 2.0/Unix 1.0	$199/325/345
CC:Mail Macintosh 2.0/OS2 3.2	$329/345

User Packs: *(For adding users to the Platform Pack)*

CC:Mail 10/25/100 user v4.0	$229/549/2097

Remote Users: *(For connecting one remote user to any CC:Mail user net via Public Telephone Lines)*

CC:Mail Remote for DOS3.3 or Mac 2.01	$199

Gateways: *(For exchange of messages with other CC:Mail Post Offices on the same LAN or Bridged LANs)*

CC:Mail Router v4.0/Fax 1.2	$839/1298

PEER-TO-PEER NETWORKS

ASA

(2) copies of Novell lite, (2) NE 2000C Cards, Cables, Terminators etc	$249

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Add-On 1 user kit w/Win3.1	**$149**
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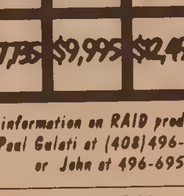

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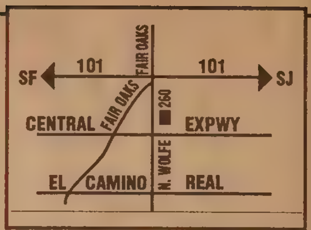

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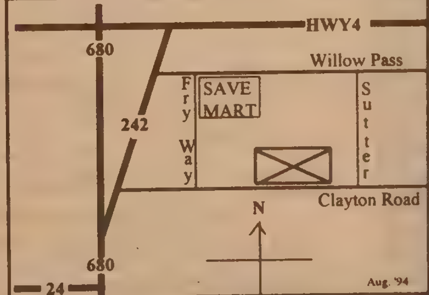

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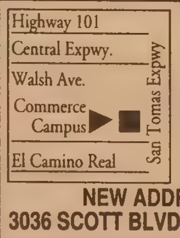

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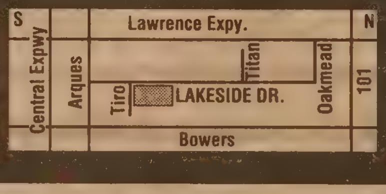

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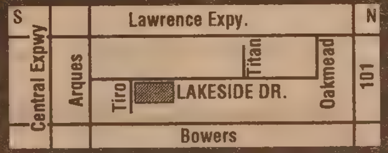

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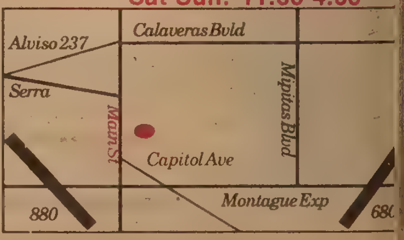

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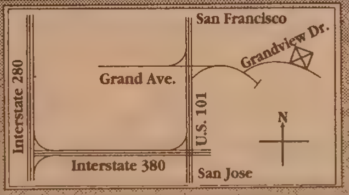
VOTED ONE OF THE BEST TEN COMPUTER STORES IN THE BAY AREA!



TERMS & CONDITIONS

Prices subject to change w/o notice. Not responsible for typos/errors. No surcharge on credit cards on advertised prices only. Please call for items not listed. One year warranty on all parts. Three years warranty on labor. Dealer & Quantity pricing available.

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INTEL CPU CHIPS

Chip	Price
PENTIUM 60/66 MHz	$550/695
486DX-4 100 MHz	575
80486DX-33 MHz	229
80486DX-50 MHz	289
80486DX2-50 MHz	$259
80486DX2-66 MHz	269
80486SX-25 MHz	75
80486SX-33 MHz	99

A.M.D. CPU CHIPS

Chip	Price
80486DX-40 MHz	$169
80486-2-50 MHz	189
80486-2-66 MHz	249

MEMORY UPGRADES - DUE TO THE RAPIDLY CHANGING PRICES CALL FOR THE LATEST PRICES!

SIMMS

IBM TYPE

Item	Price
1x9-60 3 Chip	$42
1x9-70 3 Chip	40
1x9-80 3 Chip	39
1x9-80/70/60 9 chip	42/43/44
1x9-10	36
4x8-70	122
4x9-70	139
4x9-80	132
4x9-60	140

MAC TYPE

Item	Price
1x8-100 8 Chip	$39
1x8-80 2 Chip	36
1x8-70 2 Chip	37
1x8-80/70 8 Chip	37
2x8-80/70	89
4x8-80/70	122/125
16x8-80/70	CALL
Mac IIfx 4/16 MB Kit	CALL
256K VRAM	CALL
512K VRAM	CALL
16/32/64/128MB Kits for Quadra 700/900 & Mac IIfx, ci	CALL
NEW 72 PIN SIMM for MAC LCII & CENTRIS	CALL

72 PIN SIMMS (36 BIT)

Item	Price
256Kx36-80/70	$68/70
512Kx36-80	89
512Kx36-70	99
1x36-70	149
1x36-60	150
2x36-80/70/60	299/305/318
4x36-80/70	560
8x36-70 NEW	1250

32 BIT SIMMS ALSO AVAILABLE

DRAMS

DRAMS

Item	Price
256x1-80	$2.60
256x1-100	2.00
256x1-120	2.00
256x4-70/80	5.99
64x4-80/100	3.00
1x4-80 DIPP	60
1MBx1-70	5.99
1MBx1-80/60	5.99
SOJ	CALL

ZIPPS

Item	Price
64x4-10/12 Page, 18pin	$6.00
256x4-80/70 Page, 20pin	8
256x4 Video Page 28pin TC524256Z-70	10
256x4 Video 28pin TC524256Z-60	12
1x4-80/70 Page 20pin	44
1x4-80/70 Page 20pin DIPP	48

CACHE MEMORY

Item	Price
32Kx8-20	$5.95
32Kx8-15	6.95
64x4-20	7.00
64x4-15	8.50
8Kx8-20	3.75
8Kx8-15	4.00
16Kx4-20	3.75
16Kx4-15	4.50
64x1-20	6.75
64x1-15	8.50
128x8-2	29
128x8-25	29

MATH CO's

INTEL/CYRIX/ULSI

Item	Price
287-10	$39
8087-1/2/3	45/69/89
287XL Intel Tube	49
387SL Intel Tube	65
387SX-16/20	45/64
387SX-25 Cyrix	59
387SX-33 ULSI	49
387DX-20 Intel Tube	35
387DX-25 Intel Tube	35
387DX-33 Intel Tube	65
387DX-40 Cyrix/IIT	65
4167-25/33 Weitek	200/375

CALL FOR PRICING ON IIT, ULSI & WEITEK

LASER PRINTER MEMORY

Price includes Memory, Board & Installation Instructions

IBM LASER

Item	Price
4019/4019E 1/2/3.5 MB	$89/129/179
4029 (All Model) 4 MB	179

EPSON LASER

Item	Price
6000-2/4MB	$145/179
7000-1/2/3 MB	125/149/189
Action LaserII-2/3/5 MB	159/205/299

HP LASER

Item	Price
HPII/IID 2/4 MB Board	$115/179
HP 4/4M 4/8MB	149/299
HP IIP,IIP+,III,IIID,IIIP 1/2/3/4	75/135/130/175
IIsi 4/8 MB	179/299
DeskJet 500/500c 550C 256K	89
Design Jet Plotter 4 MB	155

PANASONIC LASER

Item	Price
KXP4410/KXP4430 1/2/3/4 MB	$77/115/157/197
KXP4420/4450/4451 1/2/3/4 MB	68/110/135/197
KXP4450 1 MB	119
KXP4455 2 MB	139

OKI LASER

Item	Price
OL400 1/2 MB Board	$109/129
OL800/820 2/4 MB Board	129/189
OL810 2/3/4 MB Board	159/189/229

QMS LASER

Item	Price
PS 410 2/3/4 MB	$119/165/189
PS 860, 1700 1/4/8 MB	89/133/179
PS 815, 825, 815MR, 2/4/6	168/232/295

SHARP LASER

Item	Price
9500PS 1 MB	$75
JX-9500/9700 1/1.5/2.5/4	110/135/188/344

OTHERS

Item	Price
Apple Laserwriter II/IINT/IINTX 4 MB	$235
Brother HL-4 2/3/4 MB	119/165/189
Brother HL-8E V 1/2 MB	99/139
Compaq Pagemarq 15 & 20 1/4/8	79/139/266
Kyocera F800, F800Am F800T 2/4	95/137
NEC Silentwriter 90/290	109/124
NEC Silentwriter 95 2 MB	109
TI Microlaser 1 MB	98
Packard Bell Video Memory 1 MB	39

DELL MEMORY

Model		P/N	
433P,33P,325P,33D,325D			
	1 MB	310-2505	$89
	4 MB	310-2507	169
433TE, 425TE & Powerline Workstation			
	2 MB	310-2466	$129
	4 MB	310-2467	189
	8 MB	310-2468	349
	16 MB	310-2469	669
Power Desktop 486D, D/33, D/25, D/20, D/66			
	1 MB	310-2505	89
	4 MB	310-2507	169
	16 MB	310-2625	669
OTHER MODELS			CALL

MEMORY BOARDS

- RAMpAT 16 Bit........$85 • RAMpAT Plus 125
- SIMMply RAM for PS/1 16 Bit....................149
- SIMMply RAM..159

TEAC FLOPPY DRIVES

Item	Price
1.44 MB	$39
1.2 MB	49
Dual Floppy 1.2/1.44	119
Heat Sink w/Fan For 486's/Pentium	10/18

COMPAQ MEMORY

Model		P/N	
LTE 286	1 MB	117081-001	$89
	2 MB	117081-002	125
	4 MB	117081-003	219
SLT 286	1/4 MB	110237-001	99/259
LTE 386S/20	2 MB	12125-001	129
	4 MB	121125-002	225
Contura Lite 20/25			
	2 MB	129769-001	125
	4 MB	129769-002	245
	8 MB	129769-003	395
Portable 386	1 MB	107651-001	125
	4 MB	107653-001	310
Portable III	2 MB	10-7332-001	125
	EBD	167811-001	225
SLT 386	2 MB	118304-001	135
	4 MB	118305-001	225
Deskpro 386S (E. Board)			
	4 MB	11364-001	285
	4 MB	112534-001	189
Deskpro 386/33L, 486/33L, 50/25			
	2 MB	115144-001	105
	8 MB	116561-001	365
	32 MB	116568-001	1475
Deskpro 386/20e, 25e (E. Board)			
	4 MB	113645-001	285
Deskpro 386/20,20e,25e			
	4 MB	113132-001	199
Deskpro 286N, 386N, 386SX/20, 386/25M, 486/33M, 486S/25M, 486S/16M			
	2 MB	118689-001	189
	4 MB	118690-001	345
	8 MB	128877-001	395
Deskpro 486/33L, 486/50L, 386/33L			CALL
Prolinea 3/255 & 3/252S			
	2 MB	141738-001	135
	8 MB	141742-001	315
Prolinea 4/33	2 MB	141682-001	125
	4 MB	141684-001	189
	8 MB	141685-001	345
Other Models			CALL

TOSHIBA MEMORY

Model	Memory	Price
T8500, T5200	2/8MB	$129/449
T5100, T3100, T1600	2 MB	139
T3100SX	2/4 MB	129/199
T3200SX, SXC	2/4 MB	125/199
T4400SX, SXC, T6400	2/4 MB	135/249
T4500/4600/4800, T1900/1910, T1950/C 3.3 Volts	8/16 MB	429/769
T3300SL	2/4/6 MB	135/210/299
T3100	2 MB	135
T2200SX, SXE, T1000LE	2/4/8MB	135/210/379
T1800 Satelite	2/4/8 MB	135/210/379

NEC MEMORY

Model	Memory	Price
Prospeed 286, 386SX/16	1/2/4 MB	$125/185/269
Prospeed 386	2/4 MB	189/475
Prospeed SX/20	1/4 MB	125/249
Powermate 386/25S	2/8MB	139/369
Powermate 486/25E, 486/33I	2/8 MB	135/365
Powermate Express Series	1/4/16 MB	135/225/689
Other Models		CALL

NOTEBOOK MEMORY

Model	Memory	Price
AMIGA 4000	4/8 MB	169/310
Altima LSX	2/4 MB	165/249
Avanti	2/4 MB	160/340
AST Premium Exec	1/4 MB	119/245
AST Power Exec 3/25	4/8/16 MB	CALL
Compaq Contura Lite 20/25	2/4/8 MB	135/245/395
Chaplet Notebook	2/4 MB	155/249
Chicony 386SX	4 MB	198
Chicony 386SL/25	2/4 MB	149/229
DECPC 320P	2/4/6 MB	195/269/389
DELL 320N &212N	1/2 MB	99/125
DELL 320N, NC	2 MB	129
DELL 325N, NC	2 MB	179
DELL NL25, NL20	2 MB	179
Epson NBS3	1/4 MB	98/225
Everex Tempo LX	2 MB	135
HP 95LX	1/2 MB	159/279
IBM L40SX, N33/SX	2/4/8 MB	99/189/389
IBM N51SX & SLC	1/4/8 MB	99/155/299
IBM PS/2 N45 Sl	2 MB	179
MAC PB 160, 180	6/10 MB	249/425
MAC PB 140, 170	2/4/6 MB	89/175/229
MAC PB 100	2/4/6 MB	89/179/239
Magnavox Metalis 386SX	4 MB	199
NEC Ultralite 286F	1/4 MB	99/199
Packard Bell 386SX	1/4 MB	99/229
Panasonic CF 170/270/370	1/2 MB	85/99
Sharp PC 8501	2 MB	125
Sharp 678/6881	2 MB	129
Sampo NB SX/26, SX/25	2/4 MB	145/225
TI Travelmate 2000	1 MB	110
TI Travelmate 3000	2 MB	135
TI Travelmate 4000	4 MB	229
Zenith Turbosport 386 E	1/4 MB	125/325
Zenith Supersport SX	2 MB	189
Zenith Mastersport	2 MB	189

IBM PS/2 & PS/1 MEMORY

Model	Memory	Price
PS/1 286/386SX	2/4 MB	$135/225
PS/1 Consultant Essential/Expert	1/2/4/8 MB	79/99/189/320
386 Valuepoint	2/4/8 MB	99/179/325
486 Valuepoint	4/16 MB	189/595
PS/2 30-286	2 MB	99
50Z, 55SX, 65SX, 70	2/4 MB	99/179
40SX, 35SX,35SL	2/4 MB	99/179
70A21, A61, 121	2 MB	135
80-11, 121, 311	4 MB	245
95,90,P75, PS/1 Pro	2/4/8 MB	135/129/335
16 Bit Exp Bd For 50, 50Z, 60, 65SX	0K	179
32 Bit Exp Board for all 70 & 80 models	0K	189
RISC 6000	16/32/64 MB	745/1490/2890
Other Models		CALL

AST MEMORY

Model	Memory	Price
Bravo 3/33(LC) 325S	2/8 MB	$120/325
Bravo 486/25 & 4/33	2/8 MB	135/345
Bravo 486LC	4/8/16 MB	189/325/595
Cupid-32 Board	0K	239
Premium 386C	4 MB	189
Premium SE 450	4 MB	189
Premium 386/25, SX,33,486/25	1 MB	85
Premium II 386, 486	1/4 MB	85/189
Executive Notebook	4 MB	189
Other Models		CALL

SUN MEMORY

Model	Memory	Price
SPARC SLC	4 MB	$189
3/60, 80, 4/40, 60, 65	4/16 MB	189/795
SPARC 1 &1+, 1Pc	4/16 MB	189/795
SPARC 10	16/64 MB	745/2375
SUN Classic	16 MB	745
SPARC Server 630np	64 MB	2285
SUN IPX, ELC	4/16 MB	189/825
SPARC II	16 MB	795
Other Models		CALL

TERMS AND CONDITIONS

1. Gov't, University And Qualified Firms PO'S Welcome
2. U.S. and International Shipping VIA UPS, DHL and Federal Express
3. All Sales Must Include Sales Tax
4. All Sales Must Be C.O.D. Cashier/Certified Checks
5. There Is A 15% restocking Charge For All Refused Merchandise
6. Prices Subject To Change W/O Notice, Not Responsible For Typo's
7. Call For Latest Prices
8. 30 Day Warranty on 486 CPU's Call For Pentium Warranty

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APPLE

Desktops

Macintosh Classic	1MB Exp Board	M6361ll-A	CALL
	2MB Kit	M0219LL-A	CALL
Macintosh Color Classic	2MB Kit	M0219	CALL
Macintosh Classic II,LC,LCII	4MB Kit	N/A	CALL
	8MB Kit	N/A	CALL
Macintosh Plus, SE	2MB Kit	M0219LL-A	CALL
	4MB Kit	N/A	CALL
Macintosh II, IIx	4MB Kit	N/A	CALL
	16MB Kit	N/A	CALL
Macintosh IIFX	4MB Kit	N/A	CALL
Macintosh SE30	4MB Kit	N/A	CALL
	16MB Kit	N/A	CALL
Macintosh IIcx, IIvx IIvi	4MB Kit	N/A	CALL
	8MB Kit	M0513LL/A	CALL
	16 MB Kit	N/A	CALL
	32 MB Kit	N/A	CALL
	64 MB Kit	N/A	CALL
Macintosh IIci, IIsi	4MB Kit	M0292LL-A	CALL
	8MB Kit	M0513ll-A	CALL
	16MB Kit	N/A	CALL
	32 MB Kit	N/A	CALL
	64MB Kit	N/A	CALL
Macintosh LC III	4MB Module	N/A	CALL
LC475, LC520	8MB Module	N/A	CALL
	16MB Module	N/A	CALL
Performa 200	4MB Kit	N/A	CALL
	8MB Kit	N/A	CALL
Performa 400 Series	2MB Kit	M0219ll/A	CALL
405, 410, 430	4MB Kit	N/A	CALL
	8MB Kit	N/A	CALL
Performa 450,460,466,467	4MB Module	M15077LL/A	CALL
475, 476, 550	8MB Module	M1508LL/A	CALL
	16MB Module	N/A	CALL
	32MB Module	N/A	CALL
Performa 600	4MB Kit	MO292LL/A	CALL

Systems

Centris 610, 650	4MB Module	M1507LL/A	CALL
Quadra 610, 650	8MB Module	M1508LL/A	CALL
	16MB Module	N/A	CALL
Quadra 605/800	4MB Module	N/A	CALL
Quadra 840AV	8MB Module	N/A	CALL
	16MB Module	N/A	CALL
NEW!	32MB Module	N/A	CALL
Centris 660AV	8MB Module	N/A	CALL
Quadra 660AV	16MB Module	N/A	CALL
NEW!	32MB Module	N/A	CALL
Quadra 700, 900, 950	4MB Kit	M5952LL-A	CALL
		M0292LL-A	CALL
	16MB Kit	N/A	CALL
	32MB Kit	N/A	CALL
	64MB Kit	N/A	CALL
Workgroup Server 60	4MB Module	N/A	CALL
Workgroup Server 80	8MB Module	N/A	CALL
NEW!	16MB Module	N/A	CALL
Power Macintosh	8MB Module	(2)M1507LL/A	CALL
6100/60, 6100/60AV	16MB Module	M2838LL/A	CALL
7100/66, 7100/66AV	32MB Module	M2839LL/A	CALL
8100/80, 8100/80AV	64MB Module	N/A	CALL

Printers

PowerBook 100,140	2MB Card	M1032LL/A	CALL
	4MB Card	M1033LL/A	CALL
	6MB Card	N/A	CALL
PowerBook 145, 170	4MB Card	M4664LL/A	CALL
	6MB Card	N/A	CALL
PowerBook 145B	4MB Card	M4664LL/A	CALL
PowerBook 160, 165, 180	4MB Card	M4664LL/A	CALL
	6MB Card	M4664LL/A	CALL
	8MB Card	N/A	CALL
	10MB Card	N/A	CALL
PowerBook 165C. 180C	4MB Card	M4664LL/A	CALL
	6MB Card	N/A	CALL
	8MB Card	N/A	CALL
	10MB Card	N/A	CALL
PowerBook Duo 210. 230	4MB Card	M4184LL/A	CALL
	8MB Card	M4185LL/A	CALL
PowerBook Duo 250	4MB Card	M4184LL/A	CALL
NEW!	8MB Card	M4185LL/A	CALL
	20MB Card	N/A	CALL
PowerBook Duo 270C	4MB Card	M4184LL/A	CALL
NEW!	8MB Card	M4185LL/A	CALL
	20MB Card	N/A	CALL
	28MB Card	N/A	CALL
Newton Message Pad	1MB SRAM Card	H0028LL/A	CALL
NEW!	2MB SRAM Card	N/A	CALL
	4MB SRAM Card	N/A	CALL
	8MB SRAM Card	N/A	CALL
	16MB SRAM Card	N/A	CALL

Printers

LaserWriter II, IINTX IINTX-J	4MB Kit	M6006	CALL
LaserWriter IIf, IIg	4MB Kit	M5952LL/A	CALL
LaserWriter Pro 600,630	4MB Module	N/A	CALL
	16MB Module	N/A	CALL
LaserWriter Select 310,360	1MB Module	M2093G/A	CALL
	4MB Module	M2094G/A	CALL
LaserWriter Pro 810	4MB Board	M1442G/A	CALL
NEW!	8MB Board	M1443G/A	CALL

AST

Desktops

286 Rampage Plus	0MB Exp Board	N/A	CALL
Advantage Plus 486 Series	4MB Kit	500510-008	CALL
486DX/33	4MB Kit	501168-001	CALL
486DX2-50	8MB Kit	500824-001	CALL
486DX2-66		5001168-002	CALL
Advantage 386SX/20,25	2MB Kit	500962-001	CALL
Advantage Pro 386SX/25	500891-005	CALL	
	8MB Kit	500962-002	CALL
		500891-006	CALL
Advantage Pro	2MB Kit	500987-001	CALL
486DX/33		500891-007	CALL
486SX/25	4MB Module	500987-002	CALL
		500891-008	CALL
	8MB Module	500987-003	CALL
	16MB Module	500987-004	CALL
	32MB Kit	500987-005	CALL
Bravo 286/8,386SX/16	2MB Kit	500510-002	CALL
		500710-004	CALL
Bravo 286/16,386SX/20	2MB Kit	500510-002	CALL
386SX/25 (2,8MB only)	500710-004	CALL	
	8MB Kit	500824-001	CALL
		501168-002	CALL
Bravo LC4/25s	2MB Kit	500987-001	CALL
4/33		500891-007	CALL
4/33s	4MB Module	500987-002	CALL
4/50d	500891-008	CALL	
4/66d	8MB Kit	500987-003	CALL
Bravo 486 LP Series	16MB Module	500987-004	CALL
Bravo 486/66 MT	32MB Kit	500987-005	CALL
Premium 386C (4MB only)	4MB Kit	500510-008	CALL
		501168-001	CALL

Desktops

Premmia 4/33, 4/33s	4MB Kit	501159-001	CALL
4/50d, 4/66d	8MB Kit	501159-003	CALL
	16MB Kit	501159-004	CALL
	32MB Kit	501159-004	CALL
	64MB Kit	501159-005	CALL

Notebooks

PowerExec 4/25SL	4MB Module	501166-001	CALL
color, ColorPlus	16MB Module	501166-003	CALL
PowerExec 486	4MB Module	501318-001	CALL
color, ColorPlus	16MB Module	501318-002	CALL
PowerExec 486	4MB Module	500984-003	CALL
Special Edition	16MB Module	500984-003	CALL
PowerExec 3/33;3/25SL	2MB Module	500984-004	CALL
PowerExec EL	4MB Module	500984-001	CALL
	8MB Module	500984-002	CALL
	16MB Module	500984-003	CALL

PremiumExec

286/12	1MB Module	500814-001	CALL
386sx/20	4MB Module	500814-003	CALL
386SX/25 (4MBonly)		500814-004	CALL
386SX/25C (4MB only)			

AT&T

Printers

AT&T 593	0MB Exp Board	N/A	CALL
	2MB Exp Board	N/A	CALL
	4MB Exp Board	N/A	CALL
	4MB Exp Board	N/A	CALL

BROTHER

Printers

HL-4,4PS,4V,4Ve	0MB Board	N/A	CALL
	1MB Exp Board	MB-410	CALL
	2MB Exp Board	MB-420	CALL
	4MB Board	MB-440	CALL
HL-6 Series	0MB Exp Board	MB-600	CALL
NEW!	2MB Exp Board	N/A	CALL
	4MB Exp Board	N/A	CALL
HL-8,8e,8v	0MB Exp Board	N/A	CALL
	1MB Exp Board	MB-810	CALL
	2MB Board	MB-820	CALL
HL-10V,10DV	2MB Exp Board	MB-1020	CALL
10PS, 10DPS	4MB Board	MB-1040	CALL
HL-10H	1MB Module	MS-1	CALL
NEW!	2MB Module	MS-2	CALL
	4MB Module	MS-4	CALL
	8MB Module	MS-8	CALL
	8MB Module	MS-8	CALL

CANON

Notebooks

NoteJet 486	2MB Module	N/A	CALL
(BN-22)	4MB Module	N/A	CALL
NEW!	8MB Module	N/A	CALL

Printers

LBP-4, 4 Plus, 4 Lite	1MB Exp Board	S63-2230	CALL
	2MB Board	N/A	CALL
LBP-4sx	0MB Exp Board	N/A	CALL
	1MB Exp Board	R03-0010-000	CALL
	2MB Board	R03-0020-000	CALL
LBP-8II,8IIR, 8IIT	0MB Board	N/A	CALL
	0MB Board	N/A	CALL
	1MB Exp Board	S63-1300	CALL
	2MB Exp Board	S63-1880	CALL
	4MB Board	N/A	CALL
LPB-8SX	0MB Exp Board	N/A	CALL
	1MB Exp Board	R03-0030-000	CALL
	2MB Board	N/A	CALL
LBP-8III,8HI,8IIIR	1MB Exp Board	S63-2340	CALL
	2MB Exp Board	S63-2350	CALL
	3MB Board	S63-2360	CALL
LBP-8IV,LBP-4U	1MB Module	N/A	CALL
	4MB Module	N/A	CALL
	8MB Module	N/A	CALL
LBP-430	1MB Module	R73-3009001	CALL
	4MB Module	R73-3017001	CALL
LBP-860	1MB Module	N/A	CALL
NEW!	2MB Module	N/A	CALL
	4MB Module	N/A	CALL
	8MB Module	N/A	CALL
	16MB Module	N/A	CALL
	32MB Module	N/A	CALL

C.ITOH

Printers

C1-4,4Plus,8E	1MB Kit	CI4MD-1M	CALL
CI-6	0MB Exp Board	N/A	CALL
	2MB Exp Board	N/A	CALL
	4MB Board	N/A	CALL
CI-8	1MB Module	CI8MD-1M	CALL
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BMUG

Summertime Blues, News From MacHack

BY DAVID MORGENSTERN

I'm a little byte blue this month.

The Giants are slumping, the baseball strike is looming, my modem is dying, and my tummy is growling. Not auspicious signs, except for the last, which is my semi-annual diet taking effect.

The worst sign of all was the chaos I induced when I made the snap decision to partition my new 700MB hard drive and mix and match driver software. Just for fun. This adventure led me to partition all my other hard drives, and the older equipment did not appreciate the attention.

Fortunately, I was able to resolve all of the problems with only a couple of days' work. It actually was fun—in a perverse sort of way. That's the BMUG spirit! Take the watch apart and maybe we can get all of the pieces back in the case. Yes.

The scattering and shuffling of data around my virtual office and my baseball-bulimia have produced a rather mix-and-match result for this month's column. Onward...

One Hack Deserves Another

Every year the best and brightest Macintosh programmers meet at the MacHack conference in Ann Arbor, Michigan. The event, run by the MacHax Group, brings together Apple system code-meis-

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ters, developers from big and small companies, and even solo acts. The 72-hour hackfest runs on Jolt Cola time, starting at the switching hour of midnight and running nonstop with round-the-clock meetings and programming.

The midnight keynote address was by Saint Andy Hertzfeld, who with Bill Atkinson formed the dynamic duo that created the Macintosh. He's now bringing out General Magic's Magic Cap telecommunications operating system.

It's a testament to Andy's revered status in the Mac pantheon that hacking on PowerBooks slowed to a crawl, and only an occasional click and clack was heard, during his talk. The same cannot be said of BMUG meetings, where the combined squish of portable keyboards accompanies the demonstrations. This sound can lead one to believe that a pack of dogs with overly long nails are running around the back of the hall, but fortunately, it's only the powerbooked peanut gallery.

The conference is always highlighted by the annual Best Hack Contest. It features unusual programs written by the attendees, with some started and somewhat finished at MacHack.

This year's Hack Show lasted about three and a half hours, with an unusual food-hack entry of a two o'clock in the morning delivery order of seventy-five pizzas, provided by a Microsoft programmer. Was it an attempt to stuff ballots or stomachs?

The contest (now in its eighth year) is a good showcase for clever programmers with cool ideas. Many of the winners have gone on to work at Apple and other heavy-duty jobs. Several of the hacks have had their capabilities implemented in system software down the road.

IT'S A TESTAMENT TO ANDY HERTZFELD'S REVERED STATUS IN THE MAC PANTHEON THAT HACKING ON POWERBOOKS SLOWED TO A CRAWL, AND ONLY AN OCCASIONAL CLICK AND CLACK WAS HEARD, DURING HIS TALK.

Previous winners have found their way into shareware and "real" products, including ColorFinder, NetBunny, Oscar the Grouch, RearWindow, and VideoBeep.

The fifth-place winner, Metrowerks New & Improved, was written during MacHack by a team of programmers, including Alex Rosenberg, who can sometimes be seen in the back rows of BMUG meetings. It's an addition to Metrowerks' CodeWarrior development environment for the Power Macs. The hack uses Apple Guide technology, the new help system that was shown in the Apple booth at the last San Francisco Macworld Expo, and will see the light of day in System 7.5, due out in the next couple of months.

The hack works to liven up CodeWarrior's error windows. Currently, CodeWarrior brings up a list of compile errors in a window, and, when the error is double-clicked, brings up a window with the problematic line of code. New & Improved brings up the window with the error, and then draws a big colored "coaching mark" around or through the problem. Some Apple Guide marks include a hand-drawn circle or a strike-through "X." A number of programmers said that this gave them a number of ideas for using the Guide software to dynamically point out actions or other features within their programs.

Several emulators scored big. The fourth-place winner was a remarkably true rendition of the Stargate video game. The programmer cut a deal with an owner of a Stargate video machine. The game ROMs were removed from the video machine whenever the emulator was demonstrated, so that only one copy of the ROMs is in use at any particular time. An honorable mention went to an Apple II emulator.

The third-place prize was handed to the NewtTablet, by Bob Ebert and Jim Schram. This wild hack was created during the conference and supposedly converts the Newton MessagePad into a huge trackpad, the new pointing device found on the Blackbird PowerBook 5xx models.

The control panel and hardware hack combo was demonstrated with a Newton taped to a regulation-size keyboard. The Newton was actually connected to the Mac with a serial connection. With the current low price of the discontinued original MessagePad, it might be a good buy as a small pen-input tablet.

POArk, the Pong Open Architecture, scored the second place. Far more than a simple Pong game, it's a Macintosh-based networked game server that supports any number of players and balls, and an assortment of client platforms.

Written during the conference, the POArk demonstration included clients running on Macintosh, Windows, Newton, and almost Magic Cap. The native-coded Power Mac version had three-dimensional rotating Pong balls shaped like the head of one of the contest sponsors! The Power Macs are going to be awesome game machines, for sure.

Doug McKenna took home the Best Hack award with Fez, Frame-Evading ZoomRects. ZoomRects are the little pieces of zooming animation that occur in the Finder when opening or closing a window. Fez has a greater degree of movement, and really gives the user a solid sense of where the file is coming from or going to. Even better, it has the ability to fly around the screen and avoid any windows which get in the way. This hack is a very good piece of user interface and may find its way into future Mac system software.

The group puts out a CD-ROM with papers, source code, and the hacks themselves. If you want information on the CD or the MacHack conference, send a message to expotech@aol.com .

Thanks to BMUGer correspondents Raines Cohen and Leonard Rosenthol.

Belated April Foolz Gold

While the Mac world keeps waiting and complaining for Microsoft to finish up the Power Mac native-code versions of MS Word and Excel, I came across this piece of humor on the Planet, BMUG's electronic bulletin board service.

Although the suffering of animals in testing situations is not a joking matter, the language of the software industry can be. This juxtaposes the two.

FOR IMMEDIATE RELEASE

Seven Software Companies Added to "Watch List"

New York, N.J., Sept. 24—People for the Ethical Treatment of Software (PETS) announced today that seven more software companies have been added to the group's "Watch List" of companies that regularly practice software testing.

"There is no need for software to be mistreated in this way so that companies like these can market new products," said Mack Write, spokesperson for PETS. "Alternative methods of testing these products are available."

According to PETS, these companies force software to undergo lengthy and arduous tests, often without rest for hours or days at a time. Employees are assigned to "break" the software by any means necessary.

"It's no joke," said Write. "Innocent programs, from the day they are compiled, are cooped up in tiny rooms and 'crashed' for

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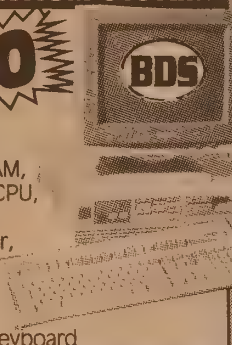

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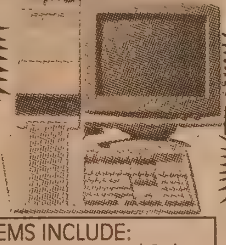

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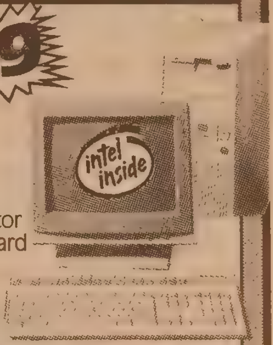

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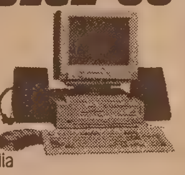

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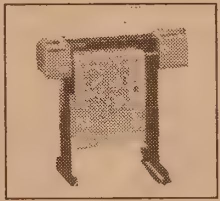

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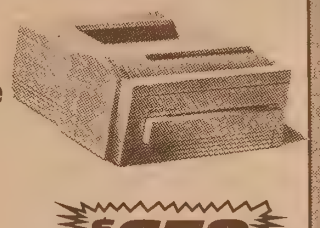

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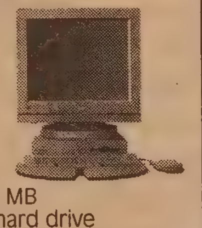
LaserJet 4+	1385	LaserJet 4siMx	4450
LaserJet 4	1295	ScanJet IIP	499
LaserJet 4P	930	ScanJet IICX	925
LaserJet 4MP	1330	Portable 310	295

Apple® Macintosh Quadra® 610 8/230



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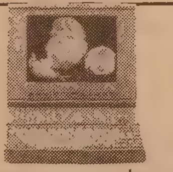

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•486DX-33/ 250 MB/4 MB/ACTIVE COLOR	$3349
•486DX2-66 /250 MB/4 MB/DUAL SCAN	$2699

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Pentium 60/66 VLP/PCI	900/999
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486DX2-66 PCI/VLB 256K	510
486DXII-66 VLB 256K	385
486DX-50 VLB 256K	465
486DX-33 VLB 256K	335
486SLC2-50 IBM VLB 64K	233
486SLC2-66 IBM VLB	271

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386SX-40	72
386SX-33	64

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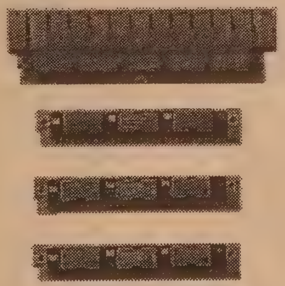
3 Com 16 Bit 507	183
3 Com 16 Bit 509	132



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1x8-60	47
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4x9-70	149
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80387DX-16, 20, 25, 33	65
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83D87-25 25 MHz	56
83D87-33 33 MHz	56
83SX87-25 16 MHz	58
83SX87-33 33 MHz	55
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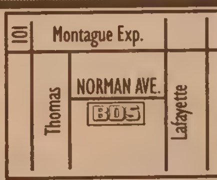

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hours on end. They spend their whole lives on dirty, ill-maintained computers, and are unceremoniously deleted when they're not needed anymore."

Write said the software is kept in unsanitary conditions and is infested with bugs.

"We know alternatives to this practice exist," he said, citing industry giant Microsoft Corp. as a company that has become extremely successful without resorting to software testing...

[the joke continued ad nauseam. dm]

(I hope that concerned readers will not think that I am discounting the animal rights movement or PETA, People for the Ethical Treatment of Animals. My wife is even a member. I just couldn't pass up the punchline.)

On the Microsoft side, here are my thoughts. It's been a pastime at BMUG meetings to conjure up conspiracy theories on why and how Microsoft has sabotaged the Power Macs by being late with the major productivity applications. If they release a buggy product, they will be nailed (as they were for other products, including Word 3.0 for the Mac), and if they are late—so this is news?

Bytes And Pieces

- Here's a little tip for users of the popular BlackBird PowerBooks. The models sport the Midas Touch trackpad that really turns people's heads.

Some people have trouble selecting hierarchical menus. It's difficult for some users to make the sideways shifting movements to select the submenus.

The answer is to use the top or bottom edges of the trackpad as a guide for your finger. The straight edge gives the finger the extra cue to keep the tracking in a nice horizontal line. The great painters of the past also "cheated" a little and used to rest their brushes on a stick when painting lines over a canvas surface, so we're in good company. Thanks to Avram Dorfman.

- There's a "feature" in new-ish Macs that you may stumble upon, and think that you've done an evil thing. Don't worry, it's not you.

If you boot up a newer Mac model, like a Macintosh 840AV, LC 575 and perhaps even the Power Macs, and hold down the Power-key longer than a second or two, you will be in for a big surprise. The next time the Command key is pressed, a programming event called an "interrupt" is generated that brings up the Mini Debugger program in the Mac ROM. This simple window is often called the Programmer's Window.

It seems that the Mac checks out the state of the keyboard's Power-key. If the key is held down too long during startup the Mac remembers this. It's like a computerized elephant. So when the Command key is pressed, your Mac decides that both the Command and Power keys are being pressed and brings up the debugger window. So what to do?

If you ever see the Mini Debugger window and want to get out of it (if that's possible and you haven't actually crashed beyond help), just remember "Gee whiz!" Type the letter "G" and hit the Return key. It tells the Mac to continue doing what it thought it should be doing.

And don't lean on the Power key at boot up, either.

- Ian Crew, BMUG board member and the operator of the BMUG upcoming event list service on the Internet, offered a useful tip.

You can set your Mac in the Views control panel to automatically line up icons in the Finder. If you clean up a window in the Special menu, it will also conform to this grid pattern.

There are two types of grids: one is in an even line, and the other is a staggered line that can save desktop real estate. You can also have the grid always turned on, so if you move an icon somewhere, it will move to the closest grid point. This isn't for everyone, but it's a nice feature. But what if you want to put an icon in a place not in the grid, and not have to go through the hassle of opening up Views and turning of the autosnap? Ian's tip is to hold down the Command key while dragging the icon, which lets you put it where you think it should go. ■

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BMUG CALENDAR OF EVENTS

August 4	Adobe Premier and PhotoShop New Versions. *Please Note: Meetings this month are in 145 Dwinelle hall.
August 11	Berkeley Systems New Products: Launch Pad (desktop interface for kids), The Simpsons Screensaver Collection, AfterDark 3.0.
August 15	BMUG South at 1922 The Alameda, United Way Office in San Jose. Nolo Press WillMaker 5.0; Wombat Internet Guild New Palo Alto PPP connections for Internet.
August 18	Meet (and Question) the BMUG Board of Directors.
August 25	Room and Demo To Be Announced.
August 29	BMUG West at Exploratorium Science museum in San Francisco. ACI 4D First (database); Second demo To Be Announced.

Please Note: BMUG main meetings are held in 145 Dwinelle hall on the UC campus (near University and Oxford). Call the BMUG Announcement Line at (510) 849-9114 for the latest news on meetings, special interest groups (SIGs) and seminars. See you there!

WHAT IS BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its fifteen thousand international members. BMUG supports many special interest groups (SIGs), 18-line Planet BMUG and 11-line BMUG Boston BBSes, a software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 500+ page book that we call our "newsletter."

Our motto continues to be: We're in the business of giving away information.

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:30 to 9:30 (or whenever we finish), on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose. Check the Announcement Line at (510)549-2684 ext. 8.

The BMUG Office, 2055 Center Street (a half block from the BART station) is open to the public 8:30 am to 4:30 pm. Please come by, say hello, and meet other members.

The BMUG HelpLine provides volunteer technical assistance and telephonic hand-holding for our members. If your question can't be answered on the spot, we try to get you in touch with someone who can help. Improve your Macintosh education and help others by becoming a HelpLine volunteer!

BMUG has one of the most up-to-date, comprehensive software libraries around, with hundreds of disks filled with the latest versions of public domain or shareware programs. BMUG also produces CD-ROM collections, including the digital video TV-ROM™ Too, and the BMUG PD-ROM.

Planet BMUG and BMUG Boston are graphical user interface FirstClass bulletin board systems, offering the latest in shareware, as well as news, private email, rumors, etc. With our 18-line capability, you can have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most online services, including e•World. BMUG can also be reached through the Internet network through UG0001@applelink.apple.com .

To get some further information about BMUG please write to: BMUG, 1442A Walnut Street, #62, Berkeley, CA 94709. If you prefer to phone our business office, call (510)549-BMUG, or fax (510)849-9026.

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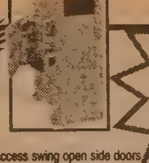

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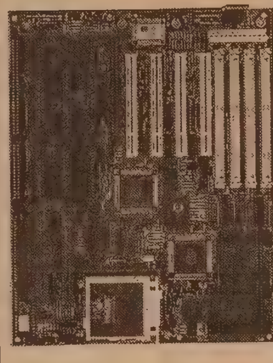
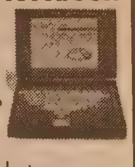


OEM and ODM Inquires Welcome.

	486VI	486V2	4GPV4 (Green-A)	4GVIP4 (Green-B)
Chipset	Contaq	Contaq	Contaq	Contaq
BIOS	AMI	AMI	AMI (Flash BIOS Optional)	AMI (Flash BIOS Optional)
Energy Green	NO	NO	YES	YES
Processors (SX/DX/DX2)	All Intel/AMD Cyrix (M7 series)	All Intel/AMD Cyrix (M7 series)	All Intel/AMD Cyrix (M7 series)	All Intel/AMD Cyrix (M7 series) INTEL DX4-100
Max. Memory	128MB (30 pins)	128MB (30 pins)	128MB (30 pins)	64MB **(72 pins)**
Max. Cache	256K	256K	1MB	1MB
Expansion Slots	2 VESA BUS 6-32 bits ISA BUS	2 VESA BUS 6-162 bits ISA BUS	3 VESA BUS 5-16 bits ISA BUS	**3 PCI BUS** **1 PCI/ISA BUS** 2 VESA BUS 3-16 bits ISA BUS
CPU Socket	Standard	Ziff (overdrive)	Ziff (overdrive)	Ziff (overdrive)
Bus Master	2 Slots	2 Slots	3 Slots	6 Slots
Dimension	8.7" X11"	8.7" X11"	8.7" X11"	8.7" X11"
Sale Price 256K Cache	$118	$128	$138	$180

GeoBook 300 Notebook



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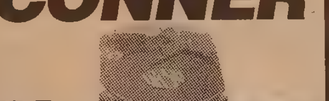

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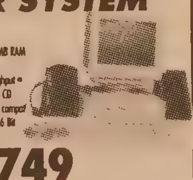

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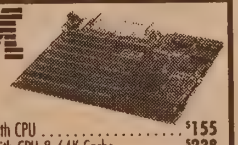

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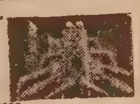

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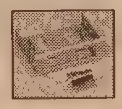
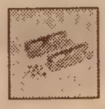
DC-820 EISA/SCSI II	$325

$4



MF-505 Mounting Kit

$3



MF-430 Bracket

$5

486 CPU Fan

Mouse Sale
(High Quality, Low Price)

Microsoft Serial Mouse	$24
MS compatible serial mouse	$8
Mouse Systems PC Trackball II	$52
Genius HiTrak Tackball	$50

14.4/14.4K DATA/FAX Modem

MNP2-4, V.42
MNP5, V.42 bis
w/BitFax & BitCom (Win)

$72 (limited quanity)

MONTHLY SPECIALS

TEAC 1.2MB & Teac 1.44MB FDD	$77
Epson dual Drive Combo	$94
IDE I/O ISA/VLB	$12/18
Mini/Med Tower Case w/PS	$37/56
Adaptec 1542C w/o kit	$156
Promise DC-4030 IDE Caching VLB	$125
Ultrastor 34F VLB SCSI controller	$259
Focus FK2001/FK9000 Keyboard	$40/52
Keytronic Keyboard	$28
Sony Double Speed CD ROM w/kit	$128

ADI NON-INTERLACE

ADI 3E+ (14" 1280X1024)	$269
ADI 3G (14" 1280X1024)	$279
ADI 4G (15" 1280X1024)	$359
ADI 5GLR (17" 1280X1024 Low-Radiation)	$689

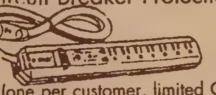
Mitsumi CD-ROM
Double Speed

250ms Access Time
300Kbps Transfer Rate
Full MPC Compatibility
16-bits Audio Card

$128 (Limited Qty)

- CPU and memory related products are not exchangeable or refundable
- Quantity is limited to stock on hand

6-OUTLET STRIP
with Circuit Breaker Protection



$3 (one per customer, limited Qty)

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- All prices reflect cash only
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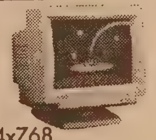
SVGA Non-Interlace MONITOR



(Model: CS-1404)
Non-Interlace 1024x768
14" SVGA .28mm dot pitch

$199 (one per customer, limited qty)

14" Monochrome Monitor $74

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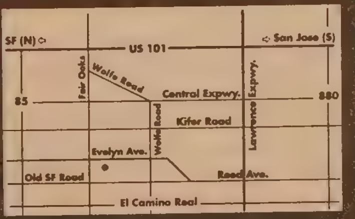

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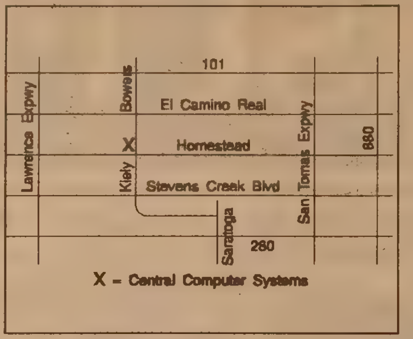

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- Reseller & quantity pricing available
- Prices are subject to change without notice and to stock on hand
- Not responsible for typographical errors
- Call for items not listed

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- Japan acct. -- Bonita Yu
- Germany, Australia -- Ann Lai
- Sales -- Alex, Jim, Lynn, Tom
- Tech. Support -- Jim Gibson, Norman Yip

SYSTEMS

BASIC SYSTEM INCLUDES :

4 MB RAM Memory
TEAC 1.44MB Floppy
IDE Controller
I/O 2S 1P
Baby AT Case w. 200W
Mitsumi 101 Keyboard
MS Serial Mouse
MS DOS 6.21
MS Windows 3.11

MOTHERBOARD	BASIC	BASIC + 170MB HDD	BASIC + 170MB HDD + VGA CARD + 14" SVGA Monito
MICRONICS COMPUTERS INC.			
486-DX2-66 ISA 256K cache VLB	$984	$1153	$1475
486-33 ISA 256K cache VLB	$934	$1103	$1425
486-33 EISA 256K cache VLB	$1194	$1363	$1685
486-DX2-66 EISA 256K cache VLB	$1244	$1413	$1785
NICE made in USA			
486-DX2-66 EISA 256K VLB	$1064	$1233	$1555
486-DX2-66 ISA 256K VLB	$918	$1087	$1409
486-33 ISA 256K VLB	$868	$1037	$1359
486-DX2-66 Mini EISA 256K VLB	$974	$1143	$1465
Green Pentium Super P54VL-PCI made in USA			
586-90 Flash Bios 256K with automatic power saving	8MB $1868	$2037	$2359
586-60 Flash Bios 256K with automatic power saving	8MB $1538	$1707	$2029
586-66 Flash Bios 256K with automatic power saving	8MB $1648	$1817	$2139

HARDWARE

1. CD ROM & SOUND CARD

CREATIVE LABS	
CD 531 w. Kit Ext	129
Digital Edge 3X Triple Speed Kit	669
Edutainment CD 16 Int (new)	389
Game Blaster 16 CD Kit (new)	369
Midi Kit + software	65
Sound Blaster Pro Value Edition	79
Sound Blaster 16 MCD / ASP	139/169
Sound Blaster 16 SCSI / ASP	149/189
Sound Blaster AWE 32	279
Video Blaster SE	245
Video Spigot for Windows	239
Wave Blaster	189
MEDIA VISION	
Fusion Double CD 16 LX Int	275
Midi Mate	49
MV2000 Family Deluxe Kit	345
MV3000 Super Deluxe Kit	395
MV4000 Premium Deluxe Kit Ext.	515
MV5000 Tripple Speed Deluxe Kit	695
Pro Spectrum 16 Multimedia Kit	*(375)
Pro 16 Multimedia System II	*(425)
Pro Audio Spectrum 16 / Studio	87/118
MITSUMI	
FX-001D 250ms Double speed w. Kit	139
NEC	
CDR510 195ms, Triple speed Int	345
3XI 195ms, 450Kb/s, Triple speed Int	435
3XE 195ms, 450Kb/s, Triple speed Ext	475
3XP Portable, Triple speed	399
Interface Kit for PC	59
PLEXTOR (TEXEL)	
DM-3028 240ms, Int / w. 16 bit cont.	259/348
DM-5028 240ms, Ext / w. 16 bit cont.	359/448
PX-43CH 4 Speed	479
Driver Kit for Media Vision Int / Ext	19/49
TOSHIBA	
3401B 200ms, 330Kb/s, Int / w. cont.	269/358
3401E 200ms, 330Kb/s, Ext	339
- with original Toshiba Case	419
TURTLE BEACH	
Maui Synthesizer	139
Monterey Multisound	365
Tahiti Audio Digital Recording Card	255
OTHERS	
CD Caddy	4.99
Adaptec 1515 16 bit Controller (w/o cable)	89
Gravis Ultrasound	129
SIIG Play Computer Games On Your TV	155
Speakers :	
Active 75 Hi-Fi Amplifier Speakers	59
Active B789 120W Speakers	69
Active SP-690 Amplified Speakers	39
Altec ACS50 Speaker Systems	75
Labtec Speakers CS150	17.50

2. CASE

Baby AT w. 200W Power	59
Baby Tower w. 200W Power	59
Mid Tower w. 230W Power	75
Mid Tower w. 250W Power: Black / White	139/129
Full Tower w. 250W Power	129
Full Tower w. 300W Power: Black / White	199/189
Pro Line Media Baby AT 250W built-in speakers	125
Slim (2 drive bay) w. 130W Power	75
Hard Disk Drive External Casing	
- 1 half ht or SCSI for Mac /PC, 40W, w. cables	69
- 2 half ht or 1 full ht for PC, 60W	95
- 2 half ht or 1 full.ht for Mac, 60W, w. cables	115
- 3 half ht or 1 full & 1 half ht for PC, 60W	109
- 3 half ht or 1 full & 1 half ht for Mac,w.cables	129

3. CONTROLLER

ADAPTEC	
1522A Fast SCSI w. Kit, 3Mb/s	145
1542CF SCSI 10Mb/s / w. Kit	175/239
2742T SCSI EISA w. Kit	365
2842VL SCSI VLB / w. Kit	235/245
2940 PCI SCSI w. Kit	279
ASW-1440 ASPI Netware Manager v3.3	65
ASW-310 Sy-Tos Plus (tape backup s/w)	*(85)99
ASW-EZ SCSI for Dos & Windows	69
BUSLOGIC	
BT 445S SCSI VLB w. Kit	199
KT 542B SCSI-2 w. Kit	199
KT 545S Fast SCSI-2 w. Kit, 10Mb/s	209
KT 747S Fast SCSI-2 EISA w. Kit	365
KT 946C SCSI PCI w. Kit (supports 8GB HD)	235
COREL	
Corel SCSI Software v1.2 / v2.0	69/89
Corel SCSI CD Power	69
DTC	
2278VL 32 bit, IDE w. I/O VLB	35
3280AS SCSI	105
FUTURE DOMAIN (SCSI)	
TMC-1660 for AT (HD only) / SVP	119/127
TMC-1680 for AT, 15Mb/s, (4F&H)	129
TMC-1680 SVP (SCSI Value Pack)	145
TMC-3260 PCI / SVP	129/165
KOUWELL	
IDE Controller only	27
IDE w. AT I/O (2S 1P 1G)	34
IDE w. AT I/O (2S 1P 1G) w. 16550 chips	49
IDE w. AT I/O (2S 1P 1G) w. 16550 & 2.88	59
IDE w. AT I/O (2S 1P 1G) VLB w. 16550 chips	69
PROMISE (drive cache)	
DC-200 IDE cache up to 16MB	95
DC-420 IDE VLB w. 512k cache up to 1MB	99
DC-4030VL IDE VLB cache up to 16MB	115
DC-2040 Bios Chips & CD Driver	15
QLOGIC	
Fast SCSI ISA w. Kit	125
Fast SCSI EISA w. Kit	199
Fast SCSI VLB w. Kit	189
Fast SCSI PCI w. Kit	299
ULTRASTOR (w/o cable)	
ULT15C IDE cache	125
VITEX	
IDE w. I/O (2S 1P) VLB	35
IDE w. 4FD/ 2S 1P/ 16550 chips	49
IDE w. 4FD/ 4S 2P 1G/ 2S16550/ VLB	89
WONDER SYSTEMS (USA made)	
IDE w. 4FD/ 2.88MB/ drivers tape/ 1.0 Mbps	35
SCSI w. CD Rom drivers	45
VL2000 IDE VLB w. AT I/O	35
VL2018 IDE VLB w. 2HD/ 4FD/ 16550/ 2.88	69
OTHERS	
BOCA IDE w. (2S 1P)	4
IDE w. I/O (2S 1P)	19.5
IDE w. I/O VLB	2
PCI SC200 SCSI-2 (NCR chip)	9

4. CPU & MATH CO

CPU :	
AMD	
386 DX-40	5
486-DX2-66	27
INTEL	
386 DX-33 / 40	49/4
486 DX-33	25
486 DX-50	32
486 DX2-50	26
486-DX2-66	30
486-DX4-100	60
Pentium 586-60	58
Pentium 586-66	68
Pentium 586-90	78
Math Co Processor :	
CYRIX	
83D86 - 33	39.5
83D87 - 40	39.5
Cx486 DLC TI-33	75
Cx486 DLC TI-40	85
INTEL	
387 DX (for 16 / 20 / 25 / 33 MHz)	85
387 SX (for 16 / 20 / 25 / 33 MHz)	79
OTHERS	
Cooling Fan for 486 CPU	9
Cooling Fan for Pentium 586	15

5. DIGITIZER

SUMMASKETCH	
III 12 x 12, 4 or 16 button	269
III 12 x 18, 4 or 16 button	549
WACOM	
UD-0608R 6 x 8, UP-201 Pressure Stylus	345
UD-1212RP 12 x 12, UP-201 Pres. Stylus	529

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6. DRIVE

FLOPPY DRIVES :

MICRO SOLUTIONS (external)

1.2 / 1.44 (use printer port)	149

SYQUEST (removable)

88MB 5.25" w. 88MB cartridge for Mac, Ext	429
88MB 3.5" w. cartridge, Int	349
105MB 5.25" w. cartridge for Mac,Ext,SCSI	389
105MB 3.5" w. cart., printer port for PC, Ext	389
105MB 3.5" w. cart., IDE host adapter	279
270MB 3.5" w. cartridge, IDE, Int	499
270MB 3.5" w. cartridge, SCSI, Ext	549
270MB 3.5" w. cart., printer port for PC, Ext	549
105MB Cartridge / 270MB Cartridge	59/75

TEAC

1.2MB 5.25"	47
1.44MB 3.5" / w. frame	37/41
2.88MB 3.5" w. frame	85
Dual - 1.2MB & 1.44MB	99

HARD DRIVES :

CONNER

CFS-210A 213MB 14ms IDE 1" ht	179
CFA-340S 340MB SCSI	259
CFS-420A 420MB 14ms IDE 1" ht	225
CFA-540A 540MB 12ms 256k IDE 1" ht	315
CFA-810A 810MB 12ms IDE 1" ht	479
CFP-1060S 1.06GB 10ms 256k SCSI	679
CFA-1080A 1.08GB 9.5ms IDE	599

FUJITSU (5 yr. warranty fr. Fujitsu)

M2694ESA 1.0GB 10ms SCSI-2 3.5" 1/2 ht	699

MAXTOR

MXT-7171A 170MB 15ms IDE 3.5"	169
MXT-7290S 290MB 14ms 64k SCSI	235
LXT-7345A 345MB 14ms 64k IDE 3.5"	215
MXT-7345S 345MB 15ms SCSI 1" ht	259
MXT-7546 546MB 12ms 256k IDE	315
Optical Rewritable 1.3GB 19ms SCSI, 4MB Ext	
Tahiti III w. Adaptec 1542 & Plastic Cart	2545
1GB Glass Cartridge	165
1GB Plastic Cartridge	135

MICROPOLIS

MC4110A 1.0GB 8.5ms 512k IDE 1/2ht	699
MC4110 1.0GB 8.5ms 512k SCSI-2 1"ht	699
MC2217A 1.75GB 10ms 512k IDE 1/2 ht	975
MC2217 1.75GB 10ms 512k SCS-2 1/2ht	975
MC1926 2.1GB 13ms 512k SCSI-2 full ht	1345
MC1936 3.0GB 11ms 256k SCSI full ht	2025

QUANTUM

LPS-270AT 270MB 12ms 128k IDE	215
LPS-340AT 344MB 12ms 128k IDE	255
LPS-340S 344MB 12ms 128k SCSI	269
LPS-525AT 525MB 10ms 512k IDE	359
LPS-540S 540MB 12ms 128k SCSI	369
EM-1080S 1.08GB 9.5ms SCSI-2	689

SEAGATE

ST3243A 214MB 16ms 32k IDE	185
ST3290A 261MB 16ms 64k IDE	219
ST3391A 341MB 12ms 256k IDE	259
ST3655A 545MB 12ms 256k IDE	335
ST3600N 525MB 10ms 256k SCSI-2	385
ST31200N 1.05GB 9ms 256k SCSI-2	699
ST12550N 2.14GB 8ms 1M SCSI-2	1599
ST12500W 2.14GB Fast-wide SCSI	1699
ST43400N 2.9GB 10ms 512k SCSI-2	1995

OTHERS

Impression CardDrive (2 slot PCMCIA)	185
Mounting Frame for 3.5" Hard / Floppy Drive	6
Removable Case for 3.5" HD IDE	39
Removable Case for 3.5" HD SCSI	42

7. I/O CARD

BOCA (fast chip serial)

Bocaboard w. cable (IRQ 3,4,5,7,10,11,12,15)	
- 4 port / 8 port / 16 port	79/119/239

KOUWELL

AT I/O (2S 1P)	25
AT I/O (2S 2P)	29
AT I/O (2S 1P 1G)	25
AT I/O (2S 1P 1G) w. NS16550 chips	49
AT I/O (2S 1P 1G) w. IDE controller	29
4 Serial Ports	45
Printer Card (1P)	15
Serial Card (XT, AT)	15

QUICKPATH

13 Port I/O w. 4-16550UARTs + Extd. IRQs (2IDE, 4F, 4S, 2P, 1G)	125
4 Serial, 16550UARTs, 8addr, 10IRQs (3,4,5,7,9,10,11,12,14,15)	99

SIIG (5 yr. warranty)

(2S 1P) w. 16550 chipset	49

STB 4-COM

4 Serial, 16 bit, w. 16554, support Com 1-8, IRQ (2,3,4,5,10,11,12,15)	109

VITEX

AT I/O (2S 2P) w. 16550 chips	45

8. KEYBOARD

ANCER (black)

101 Key	42

FOCUS

FK2001 101 Click	42
FK9000 129 Key Programmable	59

NORTHGATE OMNI

101NI	69
102	69
Ultra T	95

SIIG (5 yr. warranty fr. SIIG)

Suntouch Jr. 84 Key Mini	45
Supertouch 101 Click	53
Wave Touch 101 Soft	39

OTHERS

BTC 84 Key Mini	35
Honeywell 101	45
Keycat II 101 w. trackball mouse	65
Keytronic 101	35
Maxi 101	35
Maxi Key 124	59
Mitsumi 101	30
PT505C 101	25

9. MEMORY

DRAM

1MB x 1 - 80ns	6.20
256K x 4 - 80ns	5.50

SIMM

1MB x 9 - 60ns / 70ns / 80ns (3 chips)	40/39/38
4MB x 9 - 60ns / 70ns	149/145
16MB x 9 - 70ns	779
256K x 9 - 70ns / 80ns	14/13
1MB x 36 - 60ns / 70ns	169/160
2MB x 36 - 60ns / 70ns	330/320
4MB x 36 - 60ns / 70ns	625/619
8MB x 36 - 60ns	1280
Simm Mac: 4MB x 8 - 70ns / 80ns	159/155

SIPP

1MB x 9 - 70ns (3 chips)	41

COMPUTER MEMORY (3rd Party)

Compaq	
for Deskpro 386N	
- 2MB /4MB /8MB	109/199/369
for Deskpro 386SX20	
- 2MB / 4MB / 8MB	109/159/319
for Deskpro 386-20e/ 20/ 25e - 4MB	225
for Deskpro 486M	
- 2MB / 4MB / 8MB	109/199/369
for LTE 286 - 2MB / 4MB	129/195
for LTE 386S-20 - 4MB	239
for SLT 286 - 1MB / 4MB	99/259
for Prolinea 386-25ZS/ 25S	
- 2MB / 8MB	105/379
for ProLinea 486-33/ 50/ 25S	
- 4MB / 16MB	175/639
IBM	
for PS/2 50Z/ 55SX/ 65SX/ 70	
- 2MB / 4MB	129/229
for PS/2 80-111/ 311/ 121/ 321 - 4MB	225
for PS/2 80-A21/ A31/ A6 - 4MB	229

KINGSTON MEMORY

current price	call

LAPTOP / NOTEBOOK (3rd Party)

AST for Exec - 4MB	155
Compaq	
for Contura 3/20/25 - 4MB / 8MB	220/379
for LTE-Lite 20/ 25/ 25C - 4MB / 8MB	249/399
IBM	
for L40SX/ N33SX - 4MB / 8MB	199/399
Macintosh	
for Powerbook 140/ 170 - 6MB	299
NEC	
for Ultralite III-SL25C/ SX20	
- 4MB / 8MB	239/419
Packard Bell	
for 386SX - 2MB / 4MB	155/259
Panasonic	
for 170/ 270/ 370 - 1MB	99
Toshiba	
for T1600 - 2MB	139
for T2200SX - 2MB / 4MB / 8MB	119/229/379
for T3100SX - 2MB / 4MB	129/209
for T3200 - 3MB	169
for T3200SX - 2MB / 4MB	129/209
for T3400 - 4MB / 8MB	239/449
for T5100 - 2MB	129
for T5200/ T8500 - 2MB / 8MB	129/449
for T6400 DX / SX / SXC - 4MB / 8MB	220/379

LASER PRINTER MEMORY UPGRADE

. JET RAM (3rd party) :

Epson	
for EPL6000 - 2MB / 4MB	155/245
HP	
for Desk Jet 500/500C - 256k	69
for Laser Fax - 1MB	80
for Laser Jet II/ IID	
-1MB / 2MB / 4MB	99/145/235
for Laser Jet III/ IIIP/ IIID	
- 1MB / 2MB / 3MB / 4MB	79/125/169/215
Panasonic	
for KX-P4410/ 4430	
- 1MB / 2MB / 4MB	95/139/229
for KX-P4420/ 4450i	
- 1MB / 2MB / 4MB	99/145/235
for KX-P4450 - 1MB	139
for KX-P4455 - 2MB	169
for KX-P4400/ 5400 - 2MB	185
QMS	
for PS410 - 1MB / 2MB / 4MB	99/145/235
for PS815/ 825 - 2MB / 4MB	159/249
Texas Instruments	
for Micro Writer - 1MB	69
for Micro Laser Turbo XL - 1MB	69

. PACIFIC DATA :

Pacific 4 for HP IIP+/ IIIP/ III/ IIID	
- 1MB / 2MB / 4MB	89/135/225
1-2-4 Plus for HP II/ IID	
- 1MB / 2MB / 4MB	115/159/249
Pacific 4 SIMM	
for Laser Jet 4P/ 4MP / 4+ / 4M+	
- MS420 : 4MB	165
for HP 4/ 4Si / 1200C/ 4+ : 4MB / 8MB	189/375
for ProTracer : 5MB / 8MB	365/515

10. MODEM & FAX

BOCA

14.4 Fax modem Int / Ext	99/125
14.4 Pocket Fax modem	169
28.8 Fax 14.4 modem Int / Ext	199/235

GVC

14.4 Fax modem Int / Ext	99/119
PCMCIA 9624 Fax / 144 Fax	129/*(225)

HAYES

Accura 2400 Int / Ext	65/75
Accura 96 + Fax Int / Ext	159/169
Accura 144 + Fax Int / Ext	165/179
Accura 28.8 Fax 14.4 Ext	275
ESP Communication Single / Dual	85/125
Optima 144/144 Fax modem Ext	389
Optima 288 V.Fast 144 Fax Ext	435
PCMCIA Optima 144 Fax	285
SmartCom for Windows	*(47)

INTEL

Faxability Software	*(25)
Faxability Plus/OCR for Windows 2.0	*(75)
New Fax modem 24/96 Int	55
New Fax modem 96 Int / Ext	109/129
New Fax modem 144 Int / Ext	119/139
PCMCIA 144 Fax modem	*(229)
PCMCIA 144 International Fax modem	415
SatisFAXtion modem w. Faxability software	
- 400 144/144 v.42, v.32bis, MNP5 Int	269
- 400e 96/144 4k data buffer Ext	*(289)325

MEGAHERTZ

PCMCIA XJ124FM 96/24 Fax w. X-Jack	*(99)
PCMCIA XJ1144 144 Fax w. X-Jack	*(225)
PCMCIA XJ2144 Gold Series	255
P2144 Pocket 144/144	245

MICROCOM

Deskporte ES 28.8 Fast 14.4 Fax Ext	245
Deskporte EP 28.8 Fast 14.4 Fax Ext	335
Microporte 4232bis Fax modem	465

PRACTICAL PERIPHERALS

Fax Me (turn HP laser to fax receiving)	*(99)
Mini Tower 144FX144 Ext (w. free Compuserve)	*(159)
PM144FX144 Int	125
Pocket 144 Fax modem	299
PCMCIA 14.4 Fax modem	279
28.8 Fax 14.4 Ext (PC 288 LCD)	359

SHIVA

Net modem/E Ethernet BNC/TP	1475

SMARTLINK (w. AT&T chips)

1414BAV 14.4 Fax w. software Int	95
1414AV 14.4 Fax w. software Ext	125
1414PAV Pocket 14.4 Fax	159
1914BAT 19200/ 14.4 Fax Int / Ext	119/145

US ROBOTICS

Courier 16.8 Int / w. Fax	435/475
Courier 16.8 Ext / w. Fax	465/525
Courier v32 Terbo Fax 19.2MB w. ASL Int	359
Courier v32 Terbo Fax 19.2MB w. ASL Ext	379
Sportster 144/144 Fax MNP5 Int / Ext	109/135
Sportster 144/144 for Mac Ext	149
Sportster 28.8 Fax 14.4 Int / Ext	199/225
Worldport PCMCIA 14.4 Fax	235

ZOOM (7 yrs. warranty fr. Zoom)

96/96 w. WinFax Lite Int / Ext	125/145
144/144 w. WinFax Lite Int / Ext	135/155
144/144 Fax modem & Voice Int / Ext	165/185
28.8 V. Fast 14.4 Fax Int / Ext	199/235

ZY-XEL

U1496B 16.8 voice 14.4 Fax w. Win s/w Int	289
U1496B+ upgradable to 19.2Kbps Int	397
U1496E 16.8 voice 14.4 Fax, LED Ext	299
U1496E+ upgradable to 19.2Kbps Ext	399
U1496P Portable 16.8 /14.4 Fax 2 line	389

OTHERS

CommShare 550 Phone & Fax Auto Switching	89
CommShare 750 4 Port Switching	109
National Semi TyIN 2000 Answer/Fax Int	89
SIIG TeleCommunicator 10-in-1 Fax modem	219
Supra 14.4 Fax modem Int / Ext	99/129
Winport (modem & fax sharing software)	185

12. MONITOR

EMC

EM1412 14" Mono Amber, 90-260v	95
EM1417 14" 1024 x 768 VGA Mono Paper White	119

HITACHI

CM1797M 17" 1280 x 1024 .26 NI	975

MAG (auto switch power)

DX15F 15" 1280 x1028 .28, NI (no LED)	399
DX17F 17" 1280 x1024 .26, NI (no LED)	699
MX15F MPRII 15" Flat 1280 x 1024 .28, NI	469
MX17F 17" Flat 1280 x 1024 .26, NI	859
Mac Adapter	25

MAGNAVOX

CM4015 15" 1280 x 1024 .28 NI	349

MITAC (3 yr. warranty)

M1564 15" 1280 x 1024 .28, NI	345
M1775 17" 1280 x 1024 .28, NI	659

NANAO

F340iW 15" Flat Screen 1024 x 768 .28, NI.	635
F550i 17" 1280 x 1024 .28, NI	899
F550iW 17" 1280 x1024 .28, NI	979
F560iW 17" 1280 x1024 .26, NI	1199
T560i 17" 1280 x 1024 .25, NI	1475
T660i 20" 1280 x1024 .31, Trinitron NI	1995
F760iW 21" 1280 x1024 .31, NI	1915
F780iW 21" 1600 x 1280 .26, NI	3095

NEC (120V)

SVGA 14" 1024 x 768 .28, NI	329
3FGe 15" 1024 x 768 .28, NI, Mac	569
3V 15" 1024 x 768 NI	469
4FGe 15" Flat 1024 x 768 .28, NI, Mac	625
5FGe 17" 1024x768 .28, NI / w. Lens	955/1035
5FGp 17" 1280 x 1024 NI.	1099
6FGp 21" 1280 x 1024 NI.	1995
NEC Monitor Lens : Anti-reflection, Anti-satic	
for 4FG / 5FG / 6FG	*(65)/*(99)/185
FG/MacII Cable Adapter Kit	9.95

NOKIA

449E 15" 1280 x 1024 .28, NI	499
447B 17" 1280 x 1024 .25	955
447X 17" 1600 x 1280 .25, NI	1099
445X 21" 1600 x 1280 .26	2499

OPTIQUEST

1000S 14" 1024 x 768 .28, NI	269
1500D 14" 1280 x 1024 .28, NI	359
2000DX 15" 1280 x 1024 .27, NI	399
4000DS 17" 1280 x 1024 .27, NI	745
4000DC 17" 1280 x 1024 .27, NI	765

PANASONIC

C1795E 17" 1280 x 1024 .28, NI	699
C1991 20" 1280 x 1024 .31, NI	955

PHILIPS

1520AS 15" 1024 x 768 .28 NI	459
1762DT 17" 1280 x 1024 .25 NI	849
2130DC 21" 1600 x 1280 .28 NI	2365

PROTON

PM1561A 15" 1280 x 1024 w. speakers built-in	365

SIIG

9" VGA Mono Paper White 640 x 480	135

SONY

17SE 17" 1600 x 1280 .25, NI	975
1730 17" 1024 x 768 .25, NI	949
20SE 20" 1280 x 1024 .30, NI	1865

STANDARD TECHNOLOGIES

400-M 14" VGA Paper White	119
428-VESA 14" 1280 x 1024 .28, NI	249

VIEWSONIC

4e 14" 1024 x 768 .28, 110/220V	279
5+ 14" 1024 x 768 .25, NI, MacII	475
6e 14" 1024 x 768 .28, NI	295
14e 14" 1024 x 768 .28, NI, MPRII	349
15EX 15" 1024 x 768 .28, NI, MacII	399
17 17" 1600 x 1280 .27, NI, MacII	955
17G 17" 1280 x 1024 .28, NI	825
20 20" 1600 x 1280 .28, NI, MacII	1535
21 21" 1600 x 1280 .26, NI, MacII	1789
Mac Cable Adapter	35

*(price) .... special, while supply last

13. MOTHERBOARD

AIR (w/o cpu)

486-DX2-66 256k, 3VLB slots IDE I/O built-in	189
486-33 / DX2-66 256k EISA, 3VLB slots	349
486SH - 33 / DX2-66 256k, Green PC	145
PCI 586-60 256k ISA VLB, IDE I/O built-in	385
PCI 586-60 256k EISA, Fast-wide SCSI	615

AMI (w/o cpu)

Super Voyager II 486-33 256k VLB, 7 slots	399
Super Voyager II 486-DX2-66 VLB, 7 slots	399
Enterprise IV 486-33 256k EISA VLB	499
Enterprise IV 486-DX2-66 256k EISA VLB	499

ALARIS (IBM)

486SLC2-66 64k VLB w. CPU & Math Proc.	259

DIAMOND

486-DX Fast Bus VLB, w/o cpu	169

IBM

486BL3X-75MHz VLB w. CPU & Math Proc.	399
486SLC-33 / 66 16k Internal cache ISA v.2 w. CPU & Math Processor	239

INTEL PREMIERE (w/o cpu)

586-90 MHz 256k PCI	495

LYNX (USA made)

486-33 / 50 / DX2-66 256k VLB, w/o cpu	135

MICRONICS (w/o cpu)

BCP 386-33 64k, 4MB max w/o cpu	85
486-33 / DX2-66 256k VLB	235
JX30 486-DX2-66 256k VLB w. Zif socket	289
486-33 / DX2-66 256k EISA VLB	495
486-DX2-66 256k EISA E2	395
586-60 256k, ISA PCI, 3PCI slots	499
M5PE 586-60 / 66 256k, EISA	645
M54PI 586-90 w. CPU & IDE I/O (Neptune)	1495

NICE (w/o cpu)

486-33 / DX2-66 256k VLB, Green PC	169
486-50 / DX2-66 256k Mini EISA VLB	225
486-50 / DX2-66 256k EISA VLB	315

SUPER P5VL & P54VL-PCI

Pentium P5VL- PCI 586-66 256k Flash Bios	345
Pentium P54VL- PCI 586-90 256k Flash Bios	465

OTHERS (w/o cpu)

486-33 128k ISA	105
486-33 256k ISA	119
486-DX2-66 256k PCI, built-in SCSI & AT I/O	275

14. MOUSE & JOYSTICK

AGILER

ATB-610 Serial Trackball	24.50
Master Plus 400	19.50

ANCER (black)

3-button	22

KENSINGTON

Expert Bus 4.0	119
Expert Serial & Trackball 4.0	99

LOGITECH

C14 Serial (2-button) oem	19
Cordless II	85
Cyberman 3D Controller	69
Dexxa Serial	19.50
First Serial C15 oem / reg.	25/31
Fotoman Plus Camera for PC & PS/2	549
Mouseman Bus oem / reg.	49/64
Mouseman Serial oem / reg.	34/50
PG15 Bus oem	45
Trackman Portable / Trackman II	69/75

MICROSOFT

Ball Point Portable	85
Bus 2.0 oem / w. Bus Card	43/65
Bus 2.0 w. Expansion Card	79
Mouse 2.0 + Windows 3.1	149
PS/2 2.0	59
PS/2 & Serial Mouse oem	49
Serial 2.0 oem / manual	39/2.50
Serial 2.0 w. 9 to 25 pin Adapter	58

MOUSE SYSTEMS

Cobra (joystick)	11.50
Mouse ! Serial	19
New Point (trackball for laptop & PC)	*(29)
PC Mouse (3-button optical)	39.50
PC Trackball II	45
Serial Bus Card (9IRQs)	29
The New Mouse 400dpi (3-button)	39

JOYSTICK :

THRUSTMASTER

ACM Gamecard / Flight Stand Holder	29/19
Flight Control System / Pro	68/*(114)
Formula TI (drive control)	129
Rudder Control	115
Weapon Control MKII	*(99)

OTHERS

Quickshot Smart Game Card	16.50

15. NETWORK

3COM

3C503 Etherlink II 16 bit coax / TP	165/175
3C507 16 bit Ethernet coax / TP	289/299
3C509 Etherlink III coax / 5 pack	*(109)/529
3C509 Etherlink III TP / 5 pack	*(112/515)
3C509 Combo / 5 pack	139/559
3C529 Etherlink III for MCA coax / TP	235/239
3C579 Etherlink III EISA coax / TP	228/229
3C589 PCMCIA TP / Combo	*(199/249)
3C16270 Link Builder TP, (12TP + 1AUI)	345

ADDTRON (Novell compatible)

AE-200JL Jumperless BNC & TP	55
AE-200LB 8 or 16 bit BNC only	49
AE-200LC 8 or 16 bit BNC & TP	52
AE-200LT 8 or 16 bit TP only	49
Arcnet: Arc220TP 16 bit Combo	69
Arcnet: 8 Port Active HUB coax / TP	135/145
ET-200STS NE2000 coax (BNC + AUI)	55
Boot PROM 16 bit	15
HUB: UTP8/ L (8TP + 1BNC)	155
HUB: UTP16 (16TP + 1BNC + 1AUI)	399
Pocket Adapter: BNC / TP	125/129
Transceivers: ET10TB (TP<-->AUI)	39
Transceivers: ET10CB (BNC<--> AUI)	39

ALLIED TELESIS (CentreCOM)

AT-1500T / AT1700T (TP)	*(69)79/79
AT-1500BT / AT-1700BT (BNC + TP)	99/99
Transceivers: MX10 / 210T	42/42

ARTISOFT (Lantastic)

Central Station II	399
Ethernet s/w Kit 5.0 w. cable Dos / Win	79/139
Lantastic Z 5.0 (2 stations)	89
Lantastic for TCP/IP single / 5-user	199/785
Lantastic 6.0 Starter Kit coax 2-user	*(285)
Lantastic 6.0 Add On NR-SI 2000C	*(135)
Lantastic 6.0 Add On NR-SI 2000T	155
Lantastic 6.0 Software single user	85
- for 5-user / 10-user	339/599
- upgrade for single / 5-user	39/129
NR2000C BNC only	167
NR2000T RJ45 only	169
NR-SI 2000C coax / 5 pk / 10 pk	85/375/685
NR-SI 2000T TP / 5 pk / 10 pk	84/379/689
NR-SI 2000A Combo	115
NR-SI 2000M for MCA	139
Remote Boot ROM for NR2000	45
Sounding Board ISA	*(19)69
T-Runner 8 Port HUB / 12 Port HUB	315/515
Eagle Ethernet Cards :	
- Eagle EP2000 coax / TP	89/85
- Eagle NE2000 Plus Ethernet coax / TP	92/89
- Eagle NE3200 EISA coax w. TPA (FS)	475
- Eagle NE3210 EISA 32 bit Combo	199

ASANTE (for MAC)

AH1012 Intelligent HUB 12 Port	875
10T HUB 8 Port	255
10T HUB 12 Port	495
FriendlyNèt with AUI / BNC / TP	69

BOCA

PCI 32bit Ethernet Combo	89
PCMCIA 10BT Ethernet	169

CASTELLE

JetPress (network print server) for HP II, IID, III, IIID, coax / TP	429
LANPress (print server connects up to 4 printers)	
- Ethernet Thick/Thin coax (1P 3S)	475
- Ethernet 10BaseT (1P 3S)	475
- Ethernet BNC &10BaseT (2S 2P)	435

CeLAN

Flex HUB Ethernet SNMP	call
Repeater	call

D-LINK

PCI 32 Ethernet Combo	195
VLB 32 Ethernet Combo	295

DCA

Crosstalk 2.1 for Windows	109
Commuicator	58
IRMA Workstation Dos / Win	225/359
IRMA 3270 for MacII/ LC/ SE	695

FARALLON

PN381 PhoneNet w. Timbuktu for Win	259

IBM

Ether 16 coax / TP / Combo	89/85/95
PCMCIA 10B2 / 10BT	255/235

INTEL

EtherExpress LAN Combo	129
EtherExpress Flash LAN Combo / 5 pk	135/625
EtherExpress 16 coax / 5 pk	112/465
EtherExpress 16 Flash coax	122
EtherExpress 16 TP / 5 pk	109/*(445)
EtherExpress 16 TP Flash / 5 pk	119/545
EtherExpress 16 MCA coax / TP	175/185
EtherExpress 32 EISA (FS)	439
Flash 32 EISA (ws) Combo	235
HUB:12 Port EtherExpress ISA / EISA	565/645
LAN Protect 1.5 (virus protection)	685
LAN Sight Support 4.0	345
LAN Spool s/w 386 NLM v3.5A	425
Netport II Thin & Thick / 10BT	395/399
Netport Express XL	465
NetSatisfaxtion v2.5 for Novell	955

LANPRO

2000JC 16 bit coax (BNC only)	49
2000JT 16 bit TP with cable	49
2000JA 16 bit Combo	54
EP3010A Pocket Combo	139
HUB ER5390 : 8 Port (8TP + 1BNC)	175
HUB ER5396 : 16 Port (16TP + 2BNC)	355
Netware NE2000 Combo Starter Kit	159

NATIONAL SEMICONDUCTOR

InfoMover NE2000+ coax / 5 pack	85/399
InfoMover NE2000+ TP / 5 pack.	79/355
InfoMover NE2000+ Combo / 5 pack	99/475
InfoMover NE4100 PCMCIA coax	175
InfoMover NE4100 PCMCIA TP	179

NOVELL

Dos 7 (included Personal Netware)	55
EPROM for NE2000	35
Microdyne NE2000+ coax / 5 pack	95/425
Microdyne NE2000+ TP / 5 pack	89/*(399)
Microdyne NE2000+ Combo / 5 pack	109/*(465)
Microdyne NE3200 EISA coax	450
Netware 3.12	
- 5 / 10 / 25-user	615/1395/2085
- 50 / 100 / 250-user	2695/3995/6995
Netware 4.01	
- 5 / 10 / 25-user	825/1795/2625
- 50 / 100 / 250-user	3595/5495/9695
NPE 400 Print Server	350
NTR 2000 Token Ring	435
Personal Netware oem / reg.	49/75
Personal Netware 5-user Kit	265
Personal Netware NE2000 coax 2-user Kit	149
Unixware Personal Edition - CD version	175
Unixware SDK v1.1 - CD version	75
Unixware NFS	135

SMC (Western Digital)

8003 Plus Elite 8 bit coax	99
8013 Plus Elite 16 coax / 6 pack	118/595
8013 Plus Elite 16 TP / 6 pack	119/599
8013 Plus Elite 16 Combo / 6 pack	139/775
8013 Plus/A for MCA / TP	*(175)195/199
8033 Elite 32 coax / TP	595/599
8 Port Concentrator (8TP + 1AUI)	349
12 Port Concentrator (12TP+2AUI+1BNC)	595
Elite Ultra 16 coax oem / reg.	89/109
- 6 pack	*(459)
Elite Ultra 16 TP oem / reg.	88/108
- 6 pack	*(455)
Elite Ultra 16 Combo oem / reg.	99/119
- 6 pack	*(549)
Elite Ultra 32 EISA Combo	229
Netware Boot ROM for Ethernet	34

SYNOPTICS

Network products	call

XIRCOM

PCMCIA CE-10B2 BNC	*(235)
PCMCIA CE-10BT	*(229)
PCMCAI CE-10BC Combo	*(275)
PE3-10B2 Pocket Adapter coax	*(255)285
PE3-10BT Pocket Adapter TP	*(259)289
PE3-10BC Pocket Adapter Combo	*(295)325
PEM-10B2 w. Modem / 10BT	*(395)/*(399)

CABLES & ACCESSORIES

10BaseT, Level 3 plenum 1000'	165
Belden 8259, RG58 1000'	165
RG58 500' / 1000'	65/109
Twisted Pair 2-pair, PVC, Level 3	
- 1000' / 500'	59/45
Twisted Pair 4-pair, PVC, Level 3	
- 1000' / 500' / 200'	89/55/35

16. POWER SUPPLY

AMERICAN POWER CONVERISON

APC-400 Smart-UPS (286, 386 WS)	289
APC-600 Smart-UPS (386, 486 FS)	359
APC-900 Smart-UPS (386, 486, FS & WS)	569
APC-1250 Smart-UPS (multiple FS & WS)	699
APC-2000-2 Smart-UPS	1150
APC-400 Back-UPS (300W)	179
APC-450 Back-UPS (325W)	215
APC-600 Back-UPS (425W)	285
APC-900 Back-UPS (650W)	375
APC PowerChute Plus :	
- for Novell	65
- for OS/2, Lan Server, 3 Com	75
- for Unix / Xenix	99
- for Windows NT	69
Power Doctor (DOS) I/F Kit for Smart-UPS	79
Surge Arrest Unit	call

GENERAL

250W for Baby AT	45
250W for Baby or Mid Tower	45
250W for AT	47
250W for Full Tower	49
300W for Full Tower	69
550W for UPS	279
1200W for UPS	659

PC POWER COOLING

Standard 220 for Desktop / Full Tower	85/85
Silencer 270	
- for Slim (baby or mid tower)	149
- for AT Desktop / Full Tower	165/165
Turbo Cool 300	
- for Slim (baby or mid tower)	149
- for Desktop / Full Tower	175/175
Turbo Cool 450	
- for Desktop / Full Tower	325/325
Twinpower 900 (redundant)	925

TRIPP LITE

Isobar 4	*(29.95)
Isobar 6 w. Fax modem Protection	*(45)
Isobar Console CC16 Plus w. RJ11	75
Isotel 4 w. RJ11	*(39.95)
UPS Monitoring Board for Netware	59

17. PRINTER

BROTHER

HJ-400 Desktop Ink Jet for PC or Mac	265

CANON

BJ-200E Ink Jet	319
BJC-600 Ink Jet Par. 360dpi	599

CITIZEN

GSX 145 24 pin, 132 column	355
GSX 220 24 pin	179
GSX 230 Fonts & Quiet	219
GSX 240 Scalable Fonts & Quiet	285
Projet II Ink Jet / after rebate	279/249
Accessories :	
- Color Option for GSX 130	45
- Color Option for GSX 145	65

DEC (Digital Equipment)

Printers	call

HP (Hewlett Packard w. toner)

Desk Jet 520	289
Desk Jet 500C / 560C	395/569
Desk Jet 1200C / Postcript PC, Mac	1429/2195
Laser Jet 4	1335
Laser Jet 4+ / 4M+	1399/1915
Laser Jet 4L / 4ML	659/985
Laser Jet 4P / 4MP	965/1355
Laser Jet 4Si / 4SiMX	2895/4295
Accessories :	
- Duplex C2016A for 4Si or 4SiMX	495
- Envelope Power Feeder 75 Sheet (HP4)	279
- Jet Direct for 10BT (J2371A)	429
- Jet Direct Combo (J2372A)	465
- Legal, Letter or A4 250 Sheet Tray (HP4)	99
- Legal, Letter or A4 500 Sheet Tray (HP4)	109
- Lower Cassette w. Letter Tray (IIP, IIIP)	149
- Optional 500 Sheet Legal Letter A4 (HP4)	279
- Postcript for 4	329
- Postcript for 4Si (C2013A)	575
- Toner for II, III	79
- Toner for IIP, IIP+, IIIP	66
- Toner for 4	99
- Toner for 4L or 4P	69
- Toner for 4Si	135

LASER MASTER

Win Printer 800 Postcript	1075
Win Printer XL600 11x17, 600x660ppi	2350
WinJet 1200K (postcript for HP4+)	*(675)775

MICROTEK

TrueLaser MTP-306 6ppm, 2MB, 35 fonts	*(795)

NEC

Super Script 610 Laser 6ppm, 300x300ppi	499

OKIDATA

ML590 24-wire	429
OL410E Laser 600ppi, 4ppm	665
ML184T 9 pin, Par	229
ML320 24 pin, Epson	325

PACIFIC DATA

ProTracer II Ink Jet (CAD Plotter) A4 to A2 size, 360dpi, i960RISC, 512k, 45dBA	1259
ProTracer II-GL2 w. HP-GL2 & 2MB	1669
Accessories :	
- HP-GL Emulation Card	375
- Ink Cartridges	19.50
- Postcript Emulation Card	375
- Sheet Feeder I / II	135/115

PANASONIC

1150 9 pin, 55dBA	139
2023 24 pin, Quiet	185
2123 24 pin, 43.5dBA, Color capability	239
2124 24 pin, 43.5dBA, Color capability	319
3624 24 pin, 46.5dBA, Quiet	399

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*(price) .... special, while supply last

4410 Laser, 512k, 5ppm	499
- Corona KX-PCR3	49
- Developer KX-PDP4 / KX-PDP5	110/125
- Drum KX-PDM4 / Drum KX-PDM5	99/109
- Extra Cassette KX-PKC2	45
- Fonts Card KX-P47x	95
- Fuser Unit KX-PFS5	105
- Optional Second Cassette KX-P495	135
- Toner KX-P453	42
4420 Accessories	
- Developer KX-PDP2	95
- Drum KX-PDM2	99
- Envelope Tray KX-P431	59
- Legal Tray KX-P425	45
- Ozone filter KX-PFT2	29
- Toner KX-P451	42
4430 Laser, 1MB, 5ppm	665
- Accessories same as 4410	
4400 Led Page, ($50 Rebate + Free Toner)	499
- Apple Talk Interface KX-P412	179
- Drum Unit KX-PDM6	95
- Postcript Upgrade Board KX-PSU3	399
- Postcript Fax Option KX-PFX1	259
- RS232 Serial Interface KX-P411	95
- Toner Kit KX-P455	17.50
4450 & 4450i & 4455 Accessories	
- Developer KX-PDP1	95
- Drum KX-PDM1	145
- Envelope Tray KX-P430	59
- Legal Tray KX-P420	45
- Ozone Filter KX-PFT1	32
- Toner KX-P450	42
4455 Postcript, 11ppm	1695
5400 Led Postcript Page, 4ppm ($100 Rebate + Free Toner)	799
- Accessories same as 4400	
Others Accessories :	
- 32k Buffer Dot Matrix KX-P43	65
- Auto Sheet Feeder for 1124 KX-P36	120
- Color Upgrade Kit KX-PCK11	55
- Serial Interface Card PS-13	75
- Single Bin cut Sheet Feeder KX-PT10	95

QMS (Adobe Postcript)

PS410 2MB, 45 Fonts, 4ppm	925
- Envelope / Legal / Letter Tray	69/69/69
- Lower Cassette w. Letter Tray	149
- Toner	95

SEIKO

Smart Label Printer Pro / Plus	245/159
- Standard Label for Pro or Plus (2 rolls)	7.95

TEXAS INSTRUMENTS

Printers	call

LASER PRINTER ACCESSORIES

PACIFIC DATA

25 in One! for HP DJ500	99
25 in One! for HP II, IID, IIP, IIP+, III, 4Si	245
Complete Font Library for HP III, IIID, IIIP	255
Font Bank for all HP Lasers (stores soft fonts) 0.75MB / 1.5MB	205/269
Pacific Connect XI :	
For HP II, IID, III, IIID -	
- 5 Port 256k / 1MB (4S 1P)	309/379
- 10 Port 256k / 1MB (10S)	449/519
For HP 4, IIISi, Paint Jet XL300 -	
- 7 Port 1MB / 4MB (6S 1P)	449/649
- 10 Port 1MB / 4MB (10S)	519/179
Pacific DirectNet for Novell	369
Pacific DircetNet for Novell & UNIX	499
Pacific Page 2MB, Postcript for HP II	365
Pacific Page II/XL 4MB, Postcript for HP II	699
Pacific 4 Postcript for HP 4	259
Pacific Page PE for HP IID,IIP,IIP+,III,IIID,IIIP	279
Pacific Page PE 2MB	385
Pacific Talk	179
Postcript 4MB PE/XL for III	699
Plotter in a Cartridge for HP II	225
Plotter in a Cartridge PE for HP IID, IIP, IIP+, III, IIID, IIIP	225

PELICAN

Ribbons	call

19. SCANNER

ARTEC (hand)

ViewScan 256 w. OCR	89

HP (flatbed color)

ScanJet IICX Color w. Kit	945
- Auto Document Feeder	475
ScanJet IIP w. Kit (gray scale)	499

INFO (full page)

SF3GS Gray Scale 300dpi w. OCR	265
SF6C Color 600dpi w. OCR	435

LOGITECH (hand)

Scanman Easy Touch w. OCR	189
Scanman 256	169
- w. Omni Page OCR	185
Scanman Color	355
- w. Omni Page OCR	399

MICROTEK (flatbed color)

Scan Maker II w. Photoshop L.E.	649
Scan Maker III	2495

MOUSE SYSTEM (hand)

Page Brush 256 w. OCR	85
Page Brush Color	275

TAMARACK (flatbed color)

ArtiScan 24 bit, Color / 256 Gray Levels	
- w. Pub.L.E. & OCR 600 / 800 / 1200 dpi	575/675/945
- w. Photostyler 600 / 800 / 1200 dpi	745/845/1115
- w. Phtoshop 2.5 600 / 800 / 1200 dpi	745/845/1115
Slide Scan Kit (transparency, slide, X-ray) 600 / 800 / 1200 dpi	525/525/595

OTHERS

Fax Scanner (turn fax into scanner)	*(49)79
Omni Scan 256 for Win	*(259)

20. TAPE BACKUP

COLORADO

Backup for Win	39
DJ-20 250MB QIC-80 oem / reg.	149/165
- 3M DC2120 Tape Cartridge	14.50
- AB-11 External Tape Port	37
- Cable (2FD & tape backup)	6
- FC-20 Controller	79
- KE-09 External Kit w/o Controller	69
- TC-15 Controller w. Data Compression	169
- Unix / Xenix Driver	99
PowerTape PT-25 2GB 300Kb/s Int	965
PowerTape PTE-25 Ext	1095
PowerTape PT-50 4GB 300Kb/s Int	1525
PowerTape PTE-50 Ext	1655
Tracker 120MB (printer port)	285
Trakker 250MB (printer port)	319

CONNER

Viper 2150S Int	335
Tape Stor 250MB w. 3M Cartridge	145

EXABYTE

EXB-2501 SCSI-2 750MB - 1.5GB Int	515
EXB-2501 SCSI-2 750MB - 1.5GB Ext	685
EXB-4200 4mm Dat. 2GB Int / Ext	845/995
EXB-8205 8mm Dat. 2.5 - 5GB Int.	1375
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- Enjoyable Flighters (video)
- Henpecking (video)
- Insatiable Woman (Happiness , video)
- La Traviata (Extreme Heat / Hot Shareware)
- Men's Club (video)
- Movies for the Night (video)
- Obsessions - Oriental v.1, v.2, v.3
- Petty Baby - Pink Ladies
- Sakura - Sweet Summer (video)
- Taboo 94' (video) - Under 17

MPEG - Movie titles .... 10.95 each
- Beach Girls - Blue (hooters)
- Happy Time - Obsessions
- Pearl (China doll)

Rain Woman	39.95
Recquel Released	29.95
Rimfire Pacific Video (clip art)	19.95
Scissors & Stone (interactive)	38.95
Secrets / Seductions	24.95/24.95
Secret Interactive	29.95
Seymour Butts : Adventure (interactive)	39.95
Seymour Butts : Blowing Away	24.95
Seymour Butts : Deep Inside Share	24.95
Seymour Butts in Paradise	24.95
Seymour Butts On A Honeymoon	24.95
Sex Game / Sinfully Yours	37.95/29.95
Southern Beauty (GIF)	29.95
Squirt City v.1 / Surf's Up	22.95/19.95
Super Model Go Wild	33.95
Super Star of Porn	23.95
Super Smutware	24.95
T & A to the Maxx	18.95
Temptation	19.95
Traci, I love you	27.95
The Devil in Miss Jones	25.95
The Maddams Family	36.95
^^Thunder of Spring MPC	25.95
Too Naughty to Say No	37.95
Touch Me, Feel Me	29.95
Toys not Boys	22.95
Virgins 1 / Wanda 2	35.95/24.95
Weekend At Ernies	29.95
Wicked Movie / Wicked Wiskers	39.95/34.95
Women who love Men & Men who love Women	27.95
X-Rated Bloopers	25.95
XXX Amateur Video	19.95

2. PC SOFTWARE

ADOBE

Illustrator 4.0 w. Streamline for Win	425
PhotoShop 2.5 for Win oem / reg.	295/515
- w. Illustrator 4.0	615
Premier 1.0 for Win	185
Streamline for Win	125
Type Manager 2.5 for Win	45

AUTODESK

AutoCAD Lite	429
AuroSketch 2.0 for Win	209
Generic CADD 6.1	255
Home Series (home/ landscape/ kitchen+bath)	39

BORLAND

Brief 3.1 for Dos & OS/2	95
C++ Prof 3.12 Application Framework (Edu.)	179
C++ Professional 4.0 for Win (16/32 bit)	335
- upgrade in FD or CD	185
dBase IV 2.0 for PC	*(455)
- upgrade	99
- compiler	195
ObjectVision Pro 2.1	*(199)
Office 2.0 (includes WP 6.0a) for Win	369
- upgrade / competitive upgrade	229/275
Paradox 4.5 for Win	135
- w. Quattro Pro	165
Quattro Pro 5.0 Dos / for Win	45/45
Quattro Pro Workgroups Edition	*(175)189
Turbo C++ 3.0 Dos	75
Turbo C++ 3.1 for Win	105
Turbo C++ Visual Edition for Win	*(79)
Turbo Pascal 7.0	115
Turbo Pascal 1.5 for Win	109

CA (Computer Associates)

Clipper 5.2	479
- upgrade	115
Criket Graphic 1.3 for Win	85
Simply Accounting Dos / for Win	69/69
Super Calc 5.5	99
Super Project 3.0 for Win	399

CENTRAL POINT

Anti-Virus 1.2 WINDOS	39
Anti-Virus 2.0 Dos	*(49)
PC Tools 2.0 for Win	89
PC Tools Pro 9.0 Dos	*(79)

IBM

OS/2 for Win in FD version	*(49.95)95
- in CD version	*(39.95)
OS/2 2.11 - FD version	149
OS/2 2.11 - CD version	135

INTUIT

Quicken 7.0 forDos	45
Quicken 3.0 for Win	45
QuickBook 2.0 for Win	95
QuickPay 3.0 WINDOS	49
QuickBook & QuickPay for Win	125

LOTUS

1-2-3 4.0 for Win	*(275)
- upgrade	*(89)
1-2-3 Dos Upgrade	99
1-2-3 Rel 2.4 Dos	325
1-2-3 Rel 3.1+ Dos	385
1-2-3 Rel 3.4 single	385
Ami Pro 3.01 for Win	*(169)245
- upgrade / competitive upgrade	65/99
Approach 2.1 for Win	*(99)239
cc:Mail 10-user License	359
cc:Mail Desktop 2.03 for Win	*(65)
cc:Mail Group Pack for Win w. Organizer.	595
cc:Mail Mobile E-Mail 20. for Win	135
- upgrade	75
cc:Mail Router 5.1	*(199)225
Freelance Graphic 2.01 for Win	*(245)325
- upgrade for Win / for Dos	99/99
Improv	*(95)205
Notes Starter Pack 3.0	850
Organizer 1.1	*(75)95
Smart Suite 2.1	*(399)425
- upgrade	*(265)285

MICROGRAFX

ABC Flowcharter 3.0	315
Designer 4.0	*(425)445
- competitive upgrade	*(185)195
Graphics Works for Win	175
- competitive upgrade	85
Picture Publisher 4.0 for Win	399
- competitive upgrade	189
Windows Draw 3.0 / Value Pak	49/49

MICROSOFT

Access 2.0 for Win	299
- competitive upgrade	119
Arcade Games for Win	27
Creative Writer (age 8-14)	*(39.95)
DOS 6.21 (free upgrade to v6.22)	42
- upgrade to 6.21	49.50
Entertainment Pack for Win 1 / 2 / 3 / 4	28
Excel 5.0 for Win	294
- upgrade / competitive upgrade	89/119
Fine Artist (age 8-14)	*(39.95)
Flight Simulator 5.0	39.95
- New York Scenery	28
- Paris Scenery	28
- SF Scenery (by Mallard)	29
Fortran 5.1 Compiler	155
Fortran Powerstation 32 upgrade to NT	275
Fortran Powerstation	339
- upgrade	195
- competitive upgrade	245
Fox Pro 2.6 Single Dos or Win	*(95)
Fox Pro 2.6 Professional	449
- upgrade to 2.6 Prof	285
Macro Assembler 6.11 (MASM)	155
- upgrade	79
Mail Server 3.2 (10-user)	445
Money v3.0 for Win	26
Multimedia Viewer - CD version	315
Office 4.2 for Win - FD ver / CD ver	455/459
- upgrade / competitive upgrade	235/275
Office Professional 4.3	545
- competitive upgrade	355
Power Point v4.0	315
- competitive upgrade to v4.0	125
Profit for Win	129
Project 4.0 for Win (new)	419
- upgrade	145
Publisher 2.0 for Win	89
Scenes Screen Saver	23
Software Development Kit	239
Sound System + Windows 3.1	*(125)
Sound System 2.0 for Win	149
- software only	59
Test 2.0 for Win	315
- upgrade	99
The Best of Entertainment Pack	23
True Type Font Pack 1 / Font Pack 2	45/46
Visual Basic 3.0 for Win Standard	129
Visual Basic Professional 3.0 for Win	299
- competitive upgrade	189
Visual C++ Standard version	79
Visual C++ Professional 1.5 (w. MFC2.5, OLE2)	
- CD version	369
- upgrade to 1.5	99
Visual C++ v1.5 for Win 16/32 bit - CD	485
- upgrade	195
Visual C++ for Windows NT	*(375)
- upgrade	98
Visual Control Pack	99
Windows 3.11	53
- upgrade 3.11	49.95
Windows NT 3.1 for Win & OS/2	265
Windows Printing System	99
Windows for Workgroups (reg. version)	135
- oem version in 5.25" FD / 3.5" FD	67/69
- Workgroups Add On 3.11	49
- Workgroups Add On 3.11 MS-DOS	52
Word 6.0 Dos	299
- upgrade	99
Word 6.0 for Win	295
- upgrade / competitive upgrade	89/119
Works 3.0 Dos	99
Works 3.0 for Win oem / reg.	59/89

QUARTERDECK

DesqView 386 2.6	95
DesqView/X 1.2	165
DesqView/X Network Manager (TCP/IP)	129
Qemm 7.03	59
- upgrade	39.50

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ACT! 2.0 for Win	179
C++ Professional	319
- upgrade	189
Norton Anti-Virus 3.0 for Dos & Win.	85
Norton Commander 4.0	69
Norton Desktop 3.0 for Win	112
Norton Speed Drive (speeds Win, Dos, CD)	69
Norton Utilities 8.0 / after rebate	115/90
- competitive upgrade to 8.0.	95
On Target for Win	89
PC Anywhere 5.0 Remote & Host Dos	115
- v1.0 for Win	119
PC Anywhere Lan Complete	385
Q & A 4.0 Dos	239
Q & A for Win	*(165)
Q & A Write (word processing)	49

WORDPERFECT

Wordperfect 5.2 for OS/2	*(199)
Workperfect 6.0 Dos	285
- upgrade	95
- Educational Offer	95
Workperfect 6.0a for Win	*(255)295
- upgrade & competitive upgrade	99
- Educational Offer + Quattro Pro	125
WP + Paradox + Quattro (Borland Office)	369
- upgrade / competitive upgrade	229/275
WP Office 4.0a for Win - server	185
- Client 5 pk	299

OTHERS

After Dark Screen Saver	*(24.95)29
- More After Dark	*(23.95)29
ALDUS	
- Freehand 3.1 for Win	379
- Pagemaker 5.0 for Win	*(479)
-- upgrade 5.0.	145
-- w. Photostyler 2.0	649
- Persuasion 2.1 for Win	325
- Photostyler 2.0 for Win oem / reg.	295/355
Be Our Guest	15
Boot Con 2.0	49
By Design for Win	59
CAERE	
- Fax and Find for Win	155
- Omni Page Direct OCR 2.0	95
- Omni Page Professional 5.0 for Win	465
Cakewalk Professional 2.0 for Win	225
Calendar Creator Plus	35
Canvas for Win	265
- competitive trade up	99
Carbon Copy 6.1 Guest & Host Dos	*(95)
Carbon Copy 2.5 for Win	*(115)
Check-It Pro Analyst for Win	*(59)85
Check-It Pro vol.1 & vol. 2	85
Check-It Plus 3.0	85
Claris Works for Win	69
CommWorks for Win (Laplink V)	125
Corel Draw 3.0 - CD oem / FD	49/129
Corel Draw 2.5 for OS/2	135
Corel Draw 4.0 - CD	*(249)355
- upgrade fr 3.0 to 4.0 - CD / FD.	*(135)/215
Corel Draw 5.0 - FD + CD / CD only	565/435
- upgrade fr 4.0 to 5.0 - FD + CD	215
Corel Ventura 4.2 - FD + CD	*(124)175
- CD version	145
DacEasy Accounting 4.4	95
Dash Board 2.0 for Win (by HP)	49
Design CAD 2D 7.0 for Win	179
Direct Access 5.1 Dos	65
- 1.0 for Win	29
Disney Screen Saver	27.95
Eclipse Fax 1.2 for Win / w. OCR	69/79
Energizer Bunny Screen Saver	*(9)15
F-14 Fleet Defender	49.50
Fastback Plus 6.0 Dos / for Win	85/89
File Maker Pro 2.1 for Win	*(115)
Floor Plan Plus 3D	83
- upgrade	47
Font Minder for Win	55
Fractal Dabbler	55
Fractal Design Painter 2.0 for Win	259
- X2 for Win	88
FrameMaker 4.0 for Win	549
FTP : PC/TCP Dos / for Win	345/345
Grammitik V Dos / for Win	57/59
Harvard Graphics 2.0 for Win	245
- upgrade	85
Harvard Graphics 3.06 Dos	*(325)
Hijaak 2.1 Dos / 2.0 for Win	89/85
Idealisher 4.0	99
IIT XtraDrive 3.0 (data compression)	65
Intermission Screen Saver	29
Johnny Castaway Screen Antics	*(9)19
Kar's Power Tools for Win	115
Kid CAD (by Davidson)	29
Kodak PhotoEdge CD	89
Kodak Shoebox Image for Win	*(95)
LapLink V	105
- upgrade	55
LapLink V Netware	*(125)145
Mac-in-Dos for Win / Plus	99/139
Managing Your Money for Win	19.95
One Write Plus Accounting & Payroll	49
Passport Encore 3.0	365
Peach Tree Accounting 2.0 for Win	115
Photo Morph for Win	*(69)79
Power Basic	95
Power Japanese 2.0 for Win - FD / CD	195/199
Power Search (file manager)	*(25)39
Printshop Deluxe 1.2 for Win / Business	49/27
Procomm Plus 2.1 Dos	69
- 2.0 for Win	95
QA Plus 4.7 Dos / for Win	85/89
Quark X Press for Win v3.3	599
Qualitas 386 Max 7.0	*(59)
Sherlock for Win (filing & retrieval)	85
SpinRite 3.1	79
Soft Windows (for Power Mac)	*(295)
Stacker 4.0	95
- upgrade	55
Stacker for OS/2	129
StageSoft Accounting	125
- w. Payroll	159
- Lan version	*(255)
Star Trek Screen Saver	*(19.50)
Time Slip 5.0 Dos / for Win	*(99)169/189
Turbo CAD 3.0 w. free 500 drawing symbols	85
- Professional version for Win	219
T-Value 3.0 (interests, loan)	59
Uninstaller 2.0 (microhelp)	45
Vista Pro 3.0	69
Visio 2.0 for Win	*(125)199
Visio Express Forms Office	49
Watcom C++ v.10 16/32 bit	189
Wave 2.0 for Win (by Turtle Beach)	75
Win Comm Pro	*(75)
Winfax Pro 4.0	79
WinSense (windows optimizer)	49
Winsleuth Gold Plus	59
Wordscan 3.0 / Plus (by Calera)	169/*(399)
Wordstar v.2 for Win	39
XTree Gold 3.0	95
Xtree 1.5 for Win	69

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Swiss-Army Knife Utility Suites For DOS And Windows

Norton vs. PC Tools

BY LENNY BAILES

For many years, Symantec, Inc. and Central Point Software have been locked in a gladiatorial battle of the utilities. Data recovery and file maintenance tools, antivirus packages, backup programs, and Windows desktops—the two companies have striven to outdo each other at patching deficiencies in Microsoft's operating systems.

Although Symantec and Central Point have now become one company, the current round of upgrades from each reflects the fierce competition between them before the merger took place.

In the competition between the DOS-based products, the Norton Utilities package has traditionally had the edge in the area of data recovery and preventive maintenance. PC Tools has offered a wider range of utility programs: a mouse-driven DOS shell/File Manager, file viewers, a powerful backup program, etc.

Norton v8

Norton Utilities v8, the most recent package from either company, offers fine operating system control under both DOS and Windows. The improvements from NU v7 are subtle; you won't find the bells and whistles here that accompany new releases of Central Point's PC Tools or the Norton

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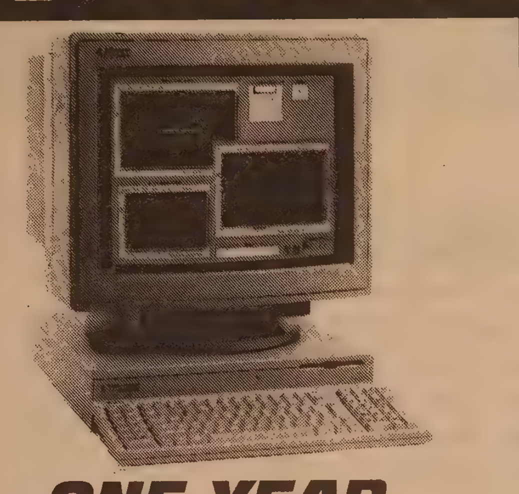
Chameleon TCP/IP for Windows	375
Sun Select PCNFS	330
AGE Xoft Ware/32 For Windows	285



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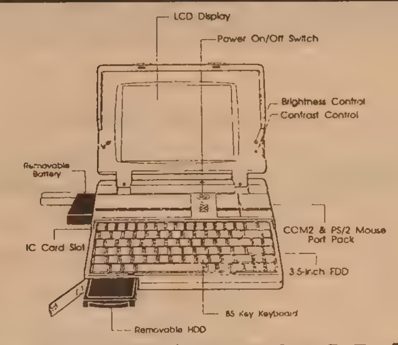

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Ready To Run LINUX/GNU/X In CD	$35
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PT Freeware for UNIX	55
Internet Source Code (TCP/IP, SLIP, PPP)	29
UNIX CD-ROM (386SD, Net BSD, & Free BSD)	29
Source Code CD-ROM (4.38 BSD Mach, GNU, X11R5)	29
Motif 1.2.3. for Solaris/LINUX/GSD	139

SunSoft (Interactive) UNIX:

Interactive UNIX/386 Base Solution (2 User)	$315
Interactive UNIX/386 Network Solution (2 User)	695
Interactive UNIX/386 Graphics Solution (2 User, Tape)	895
Interactive UNIX/386 Software Development System	555
Solaris 2.1 Desktop for x86	525
Solaris 2.1 Workgroup Server for x86	1375
Solaris Driver Developer's Kit for x86	225
Solaris 2.1 for x86 ProWorks C	975
Solaris 2.1 for x86 ProWorks C++	1455

SCO UNIX (ODT):

SCO Open Desktop 3.0 (CD-ROM)	$835
SCO Open Server Enterprise System (CD 16 User)	1535
SCO Open Desktop Development System	1255
SCO Open Server Network System (CD 16 User)	1325
SCO UNIX (2 User)	415
SCO UNIX (16 User)	905
SCO UNIX Development System	905
SCO TCP/IP for SCO UNIX	395
SCO NFS for SCO UNIX	625

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UnixWare C2 Auditing	155
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* UnixWare Personal Edition + SDK	240
XFree 86 210 For UnixWare	30

*** NETWORKING ***

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Novell Netware 4.0 (5/10/50)	825/1675/3175
NE-2000 Compatible 16-bit Ethernet Card Combo (Novell Certified)	45
10 BaseT 8 Port Hub	145
10 BaseT 12 Port Intelligent Hub	395
SMC (Western Digital) 16-bit Ethernet Card (Coax/10BaseT)	120/125
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*** SPECIAL ***

Personal Netware Starter Kit (2 Nodes)	$175
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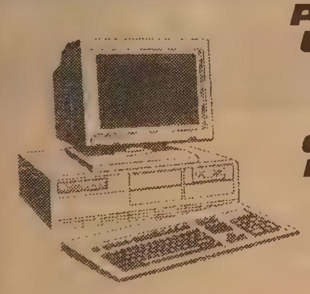
Windows For Workgroup Starter Kit (2 Nodes)	210
Windows For Workgroup Expansion Kit	110



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Windows 3.11 (w/System Purchase Only)	$48
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Windows NT Advanced Server	965
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Archive 2525S SCSI 1/4" Tape Drive	515
Wang DAT 3100 2GB DAT Drive	995
Wang DAT 3200 4-GB DAT Drive	1055
Exabyte 8505C 5-10 GB SCSI DAT Drive	2275
Exabyte 8205C 2 GB Tape Drive	1475

WINDOWS NT & WORKGROUPS
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INSTALLATION/MAINTENANCE

Hard Drive & Controllers

Adaptec 2940 PCI SCSI Controller	$290
Adaptec 2842 Local Bus SCSI Controller	290
Adaptec 1542C SCSI Controller	175
Adaptec 2742A EISA SCSI Controller	295
Bus Logic 4455S Local Bus SCSI Controller	235
Bus Logic 946S PCI Controller	290
420 MB IDE Hard Drive	235
520 MB IDE/SCSI Hard Drive	320/330
1.0 GB IDE/SCSI Hard Drive	699
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Pentium 90MHz (PCI) w/256K Cache	$1199
Pentium 66 MHz (PCI) w/256K Cache	1075
Pentium 66 MHz (VLB) w/256K Cache	975
486DX/100 (VLB) w/256K Cache	715
486DX/75 MHz (VLB) w/256K Cache	620
486DX/66 (Intel) w/256K Cache	390

Multimedia-FREE Installation

CD-ROMS

NEC 3xl (SCSI)	$355
Panasonic CR562 (AT BUS)	140
Sony 31A-03 (AT BUS)	140
Mitsumi	140
Toshiba XM3401 (SCSI)	299
CD-ROM Ext. Kit	60

SOUND CARDS

Gallant 6000 (16-Bit)	99
Sound Blaster Pro 16 Basic	135
Sound Blaster Pro 16 ASP	199
Sound Blaster SCSI II	175
Sound Blaster SCSI II/ASP	199
CD TITLES	CALL

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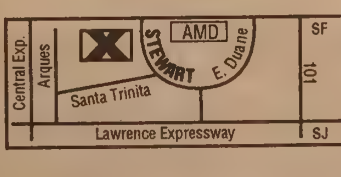

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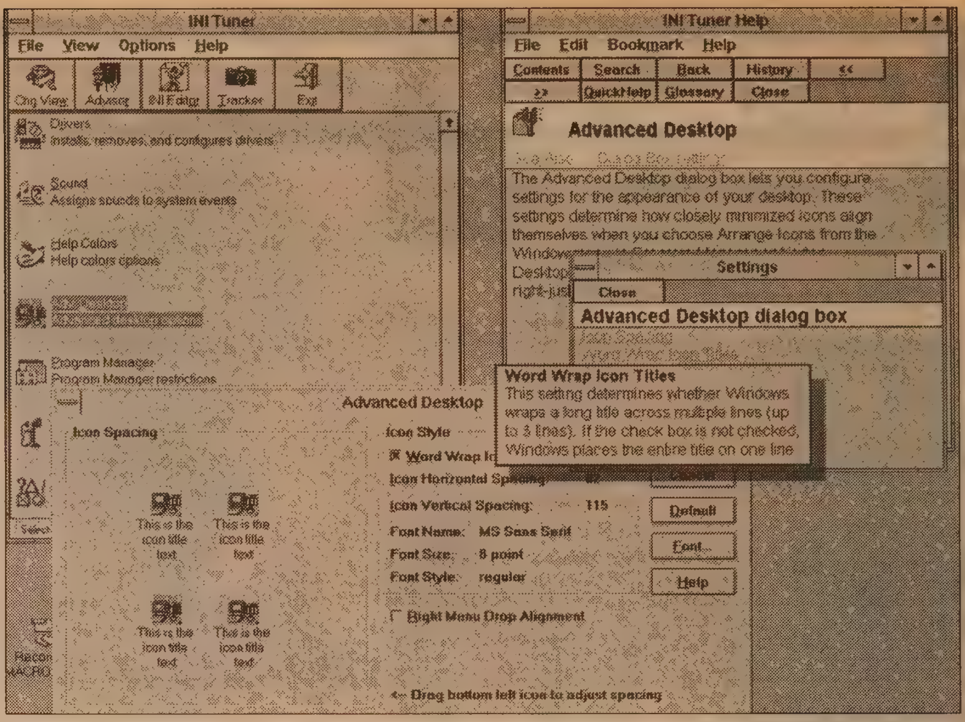
Windows Utilites...*continued*



INI Tuner
File View Options Help
Cfg View
Advisor
INI Editor
Tracker
Exit
Drivers
Installs, removes, and configures drivers
Sound
Assigns sounds to system events
Help Colors
Help colors options
Program Manager
Program Manager restrictions
Advanced Desktop
Icon Spacing
This is the icon title text
Icon Style
☒ Word Wrap Ic
Icon Horizontal Spacing:
Default
Font...
Help
☐ Right Menu Drop Alignment
← Drag bottom left icon to adjust spacing
INI Tuner Help
File Edit Bookmark Help
Contents
Search
Back
History
<<
>>
QuickHelp
Glossary
Close
Advanced Desktop
Settings
Close
Advanced Desktop dialog box

Icon Vertical Spacing: 115
Font Name: MS Sans Serif
Font Size: 8 point
Font Style: regular

The Advanced Desktop dialog box lets you configure settings for the appearance of your desktop. These settings determine how closely minimized icons align themselves when you choose Arrange Icons from the Window

Word Wrap Icon Titles
This setting determines whether Windows wraps a long title across multiple lines (up to 3 lines). If the check box is not checked, Windows places the entire title on one line

Desktop products.

The outstanding addition in NU 8 is its collection of data recovery and diagnostic programs aimed at Windows users. These are INI Tracker/Tuner/Editor/Advisor; System Watch; and new Windows versions of Disk Doctor, Speedisk, and File Compare. All of these add-ons are similar to features that Central Point includes in its PC Tools for Windows v2 package.

In the past, Symantec has responded to Central Point in the Windows market by adding new features to its Norton Desktop product. This time the latest and greatest Windows stuff got dumped into Norton Utilities instead (probably because of the logistics of staggered release dates).

INI Tracker takes a snapshot of your DOS and Windows startup files. If these files become damaged by a system crash, you can restore them from a series of backups. The scenario that INI Tracker was designed to prevent is the one where you try to install a new Windows program and something goes wrong. Your Windows worked perfectly before you tried to install that new desktop shell or font manager, but now icons are missing, your printer won't work, or Windows won't even start. INI Tracker parses successive generations of the Windows INI files (which hold the system configuration information). INI Tracker displays a line-by-line display of settings that have been added, changed, or deleted, since the last snapshot of the INIs was taken. This makes it possible for you to correct garbled information in the current files, or revert to the last good versions to preserve your previous setup.

The INI Tuner/INI Advisor utility functions as an extension to the Windows Control Panel. INI Tuner gives you direct access to more obscure features of WIN.INI and SYSTEM.INI as well as the standard Control Panel options. Instead of plowing through Microsoft documentation to change obscure settings with a text editor, INI Tuner lets you control advanced desktop options and other Windows settings through icons and dialog boxes.

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Both the Tuner and the Editor are linked to the INI Advisor, which is a context-sensitive online glossary. INI Advisor contains explanations of all of the parameters in the INI files and additional tips for customizing Windows and improving performance. If you click on a specific command or section heading in INI Editor, the Advisor pops open an appropriate explanatory help window. This well-implemented feature should be useful to anyone who needs to fine-tune Windows on a cantankerous no-name PC clone. In the past, Windows gurus had to ferret these nuggets of information out of computer magazines and third-party reference books. Now, all the information you need is accessible in a well-organized hypertext database.

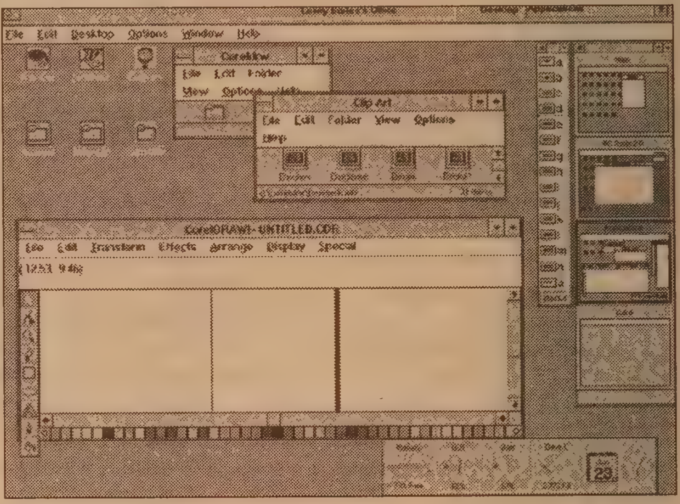
The Disk Doctor, Speedisk, and System Watch utilities in NU v8 are better than the similar tools included in Norton Desktop v3 or in Central Point's PC Tools for Windows v2 package.

Windows Disk Doctor has been beefed up to the point where it is actually as useful as the DOS version. Disk Doctor handles all flavors of disk compression, including Stacker, AddStor, Doublespace, and Microsoft's new DriveSpace format. (Central Point's Windows DiskFix does not support either Stacker or DriveSpace.)

The Central Point disk repair and optimizer utilities have some limited ability to run in the background, but they may not work properly if you have applications and files open on the desktop. The Norton v8 disk utilities recognize open files and work around them. You can optimize a disk in the background while you work in a word processor. And for people who like toys, Norton's Disk Doctor now plays music and shows an animated cartoon while it examines your disk. (Turning off the cartoon option makes Disk Doctor work a lot faster.)

System Watch displays information on available Windows memory, system resources, and hard disk space. When you run low on something, it can flash at you, sound an alarm, or pop up a dialog box, depending on which option you choose.

Other minor upgrades to Norton Utilities v8 include a diagnostic test of system interrupts and the extension of FileFix to repair corrupted WordPerfect 6 files. The other features: the NDOS command shell, disk cache, disk editor, unerase, rescue disk, and various file utilities are carried over, mostly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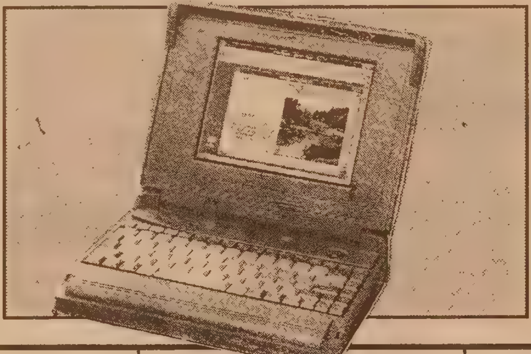

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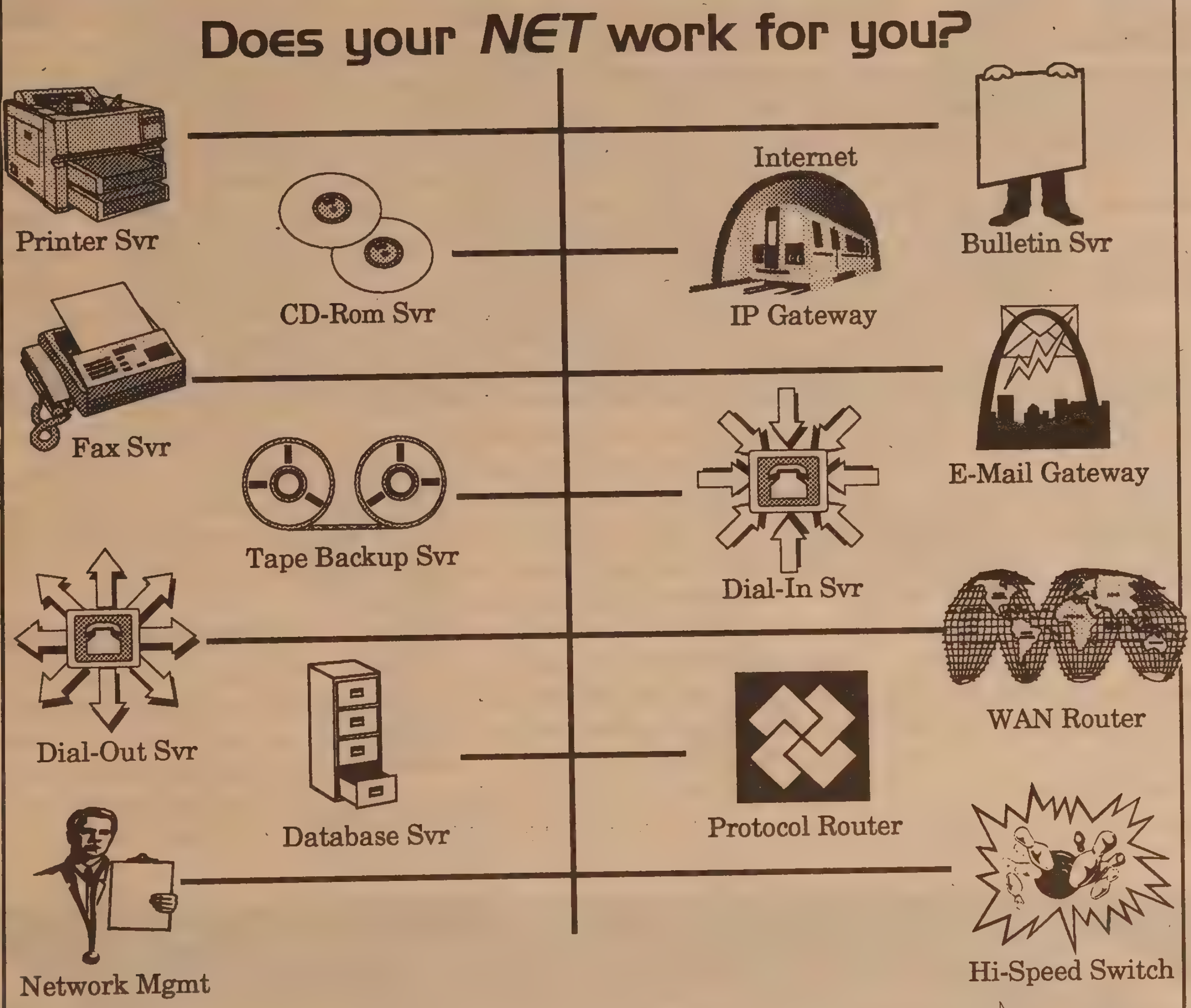
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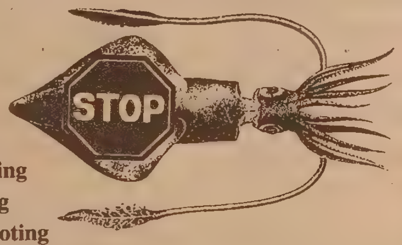

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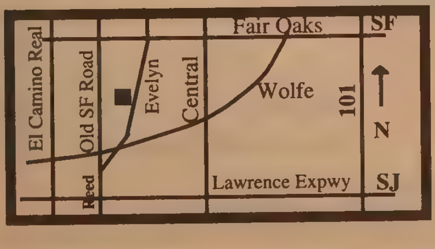
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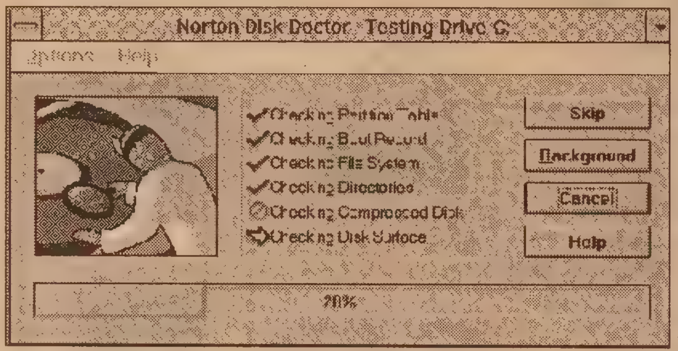
PC Tools For Windows

In the past two years, PC Tools has evolved from a giant grab-bag of DOS and Windows utilities into two more streamlined packages: PC Tools for Windows and PC Tools for DOS.

The PC Tools for Windows package is competitive with Symantec's Norton Desktop for Windows.



In addition to the overlapping features (substitute desktop, file manager, disk repair utilities, antivirus utilities, backup program, file compare, and diagnostics), PC Tools for Windows also offers some unique features.

The Desktop shell includes a virtual desk feature that saves multiple productivity configurations. You can mix open applications, program groups, and nested data folders on each virtual desk. For instance, you might set up a word processing desktop with Word for Windows, Clock, and a document folder open on the screen. Another "utilities" desktop can contain different open windows. The desks can be saved so that when you start Windows, your applications open automatically and each desk displays a different set of programs and folders.

The System Consultant feature in PC Tools for Windows is broader in scope than Symantec's INI Tuner. System Consultant analyzes not just Windows parameters, but your entire system configuration. After the analysis, you get an interactive screenful of recommendations for changes in your CONFIG.SYS, AUTOEXEC.BAT, and INI files. In addition to modifications in the Windows startup files, you may be advised to upgrade your DOS version, change PATH and Environment variables, or replace the CMOS battery on your motherboard. If you click "Do It," then Consultant makes software modifications for you.

System Consultant can't recover damaged INI files like the new Norton modules, and it doesn't have an extended set of Control Panel options for Windows customization. Consultant does have an INI editor with online explanations of what the various parameters do, but this feature is much less complete than the Norton hypertext database. The main goal of System Consultant is to provide diagnostic information, and to make some system changes for you automatically.

In comparing PC Tools for Windows to the Norton products, an important thing to remember is that Symantec's "INI Tuner/Advisor" and "System Watch" utilities are in not included in Norton Desktop for Windows v3.0. Instead, they're both part of the Norton Utilities v8 package. The disk repair programs bundled with the earlier Norton Desktop package are less powerful than the current PC Tools for Windows modules. To get the same functionality that Central Point offers in PC Tools for Windows v2, you have to buy *two* Symantec products.

PC Tools Professional For DOS

PC Tools Professional v9 for DOS contains no Windows utilities whatsoever, but it has some features not found in any of Symantec's Norton products. The most interesting of these is the ability to save the memory state and configuration of your PC on a disk image file. This allows you to restore

continued on page 303

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10:30AM - 5:00PM	Seminars	Santa Clara Ballroom
12:00PM - 1:00PM	Lunch	Santa Clara Ballroom
5:00PM - 7:00PM	Social Hour/No-Host Bar	Santa Cruz Ballroom
7:00PM-12:00AM	Dinner & Dance Party	Convention Grand Ballroom

Seminar Programs

I.	Microsoft PC Market Review & Future	By: Mr. Curtis Freet
II.	Microsoft OEM Benefits	By: Mr. John Wang & Ms. Anne Murphy
III.	Taiwan New Power PC Consortium	By: Mr. Chi-Yuan Chin
IV.	Information Super Highway	By: Mr. David Quong

Keynote Speech: The Future Windows Preview & Demo of Windows-Chicago

To R.S.V.P. your attendance, please complete the following form and fax to NBI at (510)656-3778 before 7/27/94 (photocopies are acceptable) or call Li-Ping Chen at (510)656-3776 for detail information.
***Dinner Tickets will not be available at the door.**

Please check the box below which applies to you:
*** ☐ I would like to attend the Tech/Vendor Fair. (Free)**
*** ☐ I would like to attend the seminars. (Free)**
*** ☐ I would like to attend the dinner & dance party (at $50.00 per person).**
Please make check payable to N.B.I. & mail to: 43022 Christy St., Fremont, CA 94538

Name: ____________________
Title: ____________________
Company: ____________________
Address: ____________________
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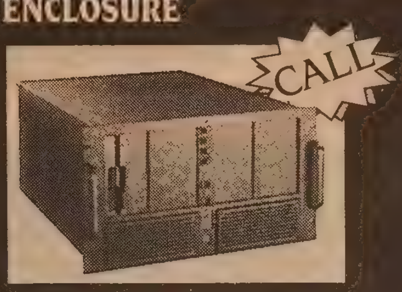
Tel: ____________________
Fax: ____________________

19" RACKMOUNT ENCLOSURE

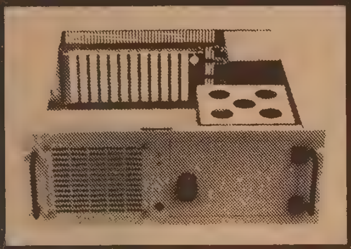
19" RACKMOUNT W/MONITOR

19" RACKMOUNT ENCLOSURE



19" RACKMOUNT MONITOR KIT

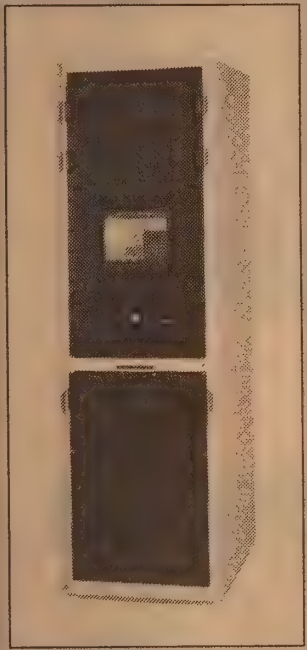
MADE IN U.S.A.



- 19" Rackmounting
- Integral Monitor
- 10" .28 dot pitch SVGA Color
- 9" Mono-TTL or VGA
- 8 or 14 Slot Passive Backplane
- 8 Slot Motherboard Mounting
- U.S.A. Manufactured

- 8, 14 & 20 Slot Options
- Dual Power Supplies
- Power Supply Redundancy Option
- 8 Drive Bays
- 8 Fans
- Motherboard or Passive Backplane
- 200-1000 Watt Power Supply
- USA Manufactured

19" RACKMOUNT KEYBOARD



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Features:

- FILE SERVER
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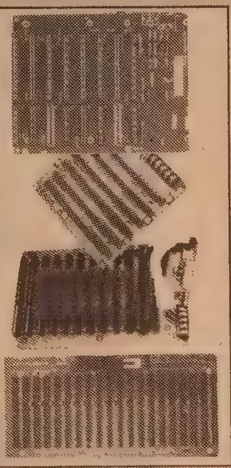
- MULTI-FUNCTIONAL SYSTEM
- 24 DIFFERENT SYSTEMS CAPABILITY RUNNING AT SAME TIME
- CAPABLE OF CUSTOMIZED SPECIFICATIONS

PASSIVE BACKPLANE BOARD

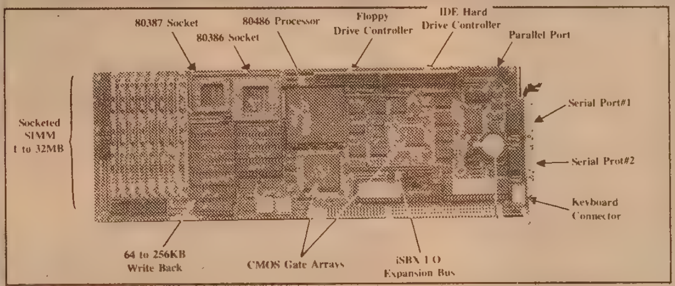


6 SLOT	$53
8 SLOT 6 AT & 2 XT	$35
8 SLOT	$59
12 SLOT	$90
14 SLOT	$94
18 SLOT	$180
20 SLOT	$194

EISA PASSIVE BACKPLANE BOARD AVAILABLE

SPECIAL OPTION
- 14 SLOT SEGMENTED 6,4,4
- 18 SLOT SEGMENTED 5,4,4,5
- 20 SLOT SEGMENTED 5,5,5,5

386 & 486 ALL-IN-ONE CPU CARD



- 4 Upgradable Models using Intel CPU's
  - -80386DX-33 MHz
  - -80486SX-33 MHz
  - -80486DX-33 MHz
  - -80486DX2-25/50 & 33/66 MHz
- 80386 & 80486 Upgradable Processor with AMI BIOS
- 256K Write Back Cache Memory
- Up to 32 MB of 70ns SIMM DRAM
- IDE Hard Disk & Floppy Disk Controller
- 2 Serial/1 Parallel Ports
- 80387 Co-Processor, 80486DX Internal Co-Processor
- Watch Dog Timer Can Be Set 500ms or 1sec, time out
- Programmable shadow RAM Capacity
- 6-Layer PCB Design To Meet Factory Floor Requirements

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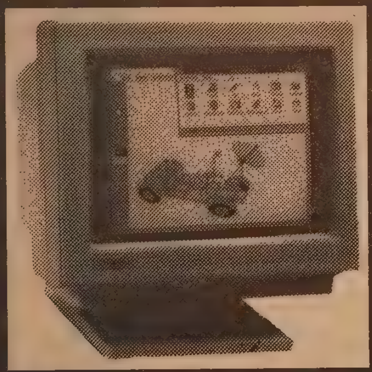
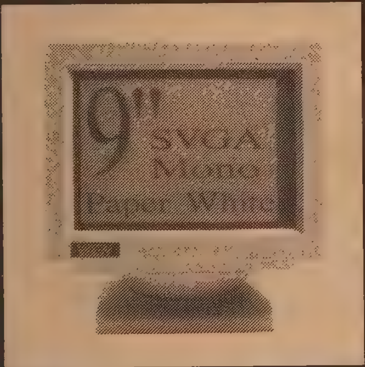
EISA CPU CARD AVAILABLE



14" SVGA COLOR MONITOR

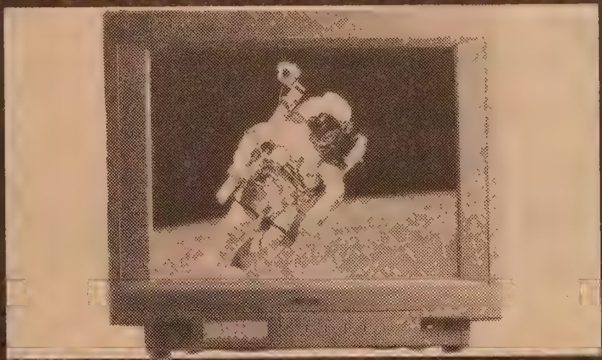
- CRT 14" DIAGONAL NON-GLARE FLAT
- DOT: .28mm
- RES: 1024 X 768 NON-INTERLACE, 800 X 600, 720 X 400, 640 X 480, 640 X 350
- POWER SUPPLY: 120-240V AUTO SELECTION



9" SVGA MONITOR MONO PAPER WHITE

- CRT: 9" x 90 DEFLECTION NON-GLARE PAPER WHITE
- RES: 1024x768, 720x400, 640x480
- POWER SUPPLY: 100-240V

17" SVGA COLOR MONITOR



- CRT: 17" Non-Glare Etched w/dynamic focus, Invar shadow mask, Flat Sqaure Tube
- DOT: 0.26mm
- RES: 1280 x 1024 Non-Interlaced 800x600, 1024x768
- VESA, VGA, & Macintosh Compatible
- COLORS: Unlimited
- POWER SUPPLY: 90-260 AutoSwitchable

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1. COLOR MONITORS

Model	DESCRIPTION	PRICE
HMC-423B	14" SUPER VGA .39 Dot Pitch	$200
HCM-423E	14" SUPER VGA .28 Dot Pitch	$228
HCM-433E	14" SUPER VGA .28 Dot Pitch Non-Int	$238

2. MONOCHROME MONITORS

Model	DESCRIPTION	PRICE
WEN	9" SVGA MONO PAPER WHITE	$150

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1 year warranty on parts.

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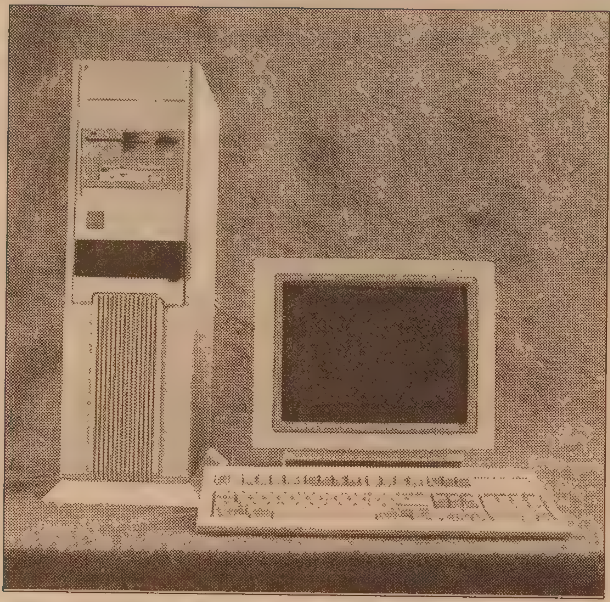

486 DX-33 VLB

- 486VLB Motherboard
- 0MB RAM expandable to 32MB
- AMD DX-33 processor
- 256K Cache memeory
- 3 32-bit VLB expansion slots
- 3.5" 1.44MB floppy drive
- VLB IDE HD/FD Controller
- 2 serial, 1 parallel & 1 game port
- Mid-Tower with power supply
- 101-key enhanced keyboard

$399

FREE **AC-LINE CONDITIONER!** With any complete Pentium system purchase, receive one 300VA AC-Line Conditioner **FREE!**

(Limit one per customer) **$59.00 Value!**

FREE **MS-BALLPOINT MOUSE!** With any notebook purchase, receive one Microsoft Ballpoint Mouse **FREE!**

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FREE **COMPUTER CLEANING KIT!** With any complete 486 system purchase, receive one cleaning kit **FREE!**

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1MBx9/4MBx9, 70ns	$36.99/135.00
4MB (1MBx36), 72 pin	179.00
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486 ISA w/ 64K Cache	59.00
386DX-40 with CPU, 128K Cache	89.00
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Genoa 486 VLB w/ 256K Cache	149.00
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486DLC-40 w/ CPU, 128K Cache	139.00
Pentium VLB/ISA 90MHz w/ 512K Cache	299.00
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Alaris 486SLC2-66	
VLB w/ 64K Cache	199.00
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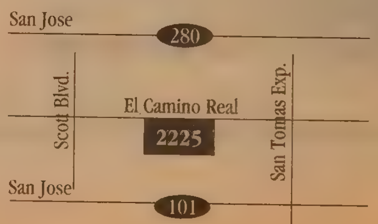

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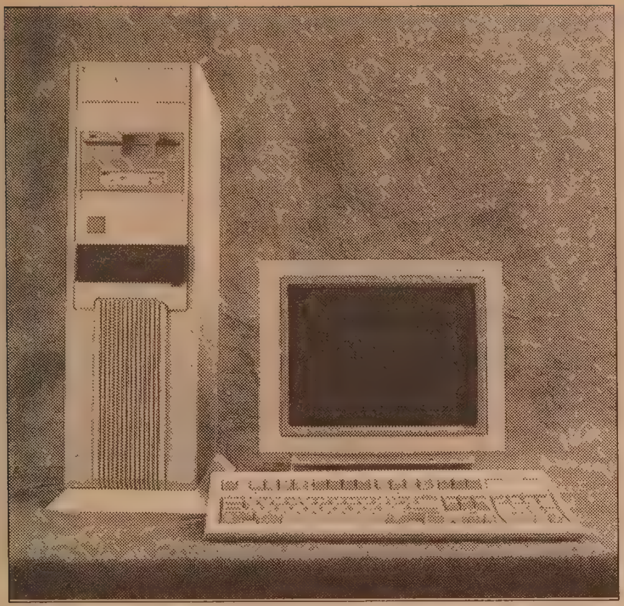

90MHz Pentium PCI/VLB

- Pentium PCI Motherboard
- 16MB RAM expandable to 128MB
- Intel Pentium 90MHz processor
- 512K Cache memory
- Dual media floppy drive
- 4 PCI, 2 VLB, 5 ISA slots
- PCI IDE Controller card
- 2 serial, 1 parallel & 1 game port
- Medium tower case
- 101-key enhanced keyboard
- 1 year parts and labor warranty

$1699

90MHz Pentium VLB

- Pentium PCI Motherboard
- 16MB RAM expandable to 128MB
- Intel Pentium 90MHz processor
- 512K Cache memory
- Dual media floppy drive
- 3 VLB, 8 ISA slots
- VLB IDE Controller card
- 2 serial, 1 parallel & 1 game port
- Medium tower case
- 101-key enhanced keyboard
- 1 year parts and labor warranty

$1616

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CD HOLDER!
With any complete multimedia Kit purchase, receive one CD Holder **FREE!**
(*Limit one per customer, no reseller*) **$15⁰⁰ Value!**

FREE

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With any Panasonic Dot Matrix printer purchase, receive one printer ribbon **FREE!** **$14⁰⁰ Value!**
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With any monitor purchase, receive one surge protector **FREE!**
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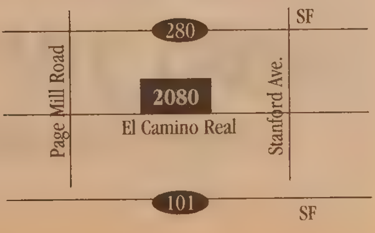

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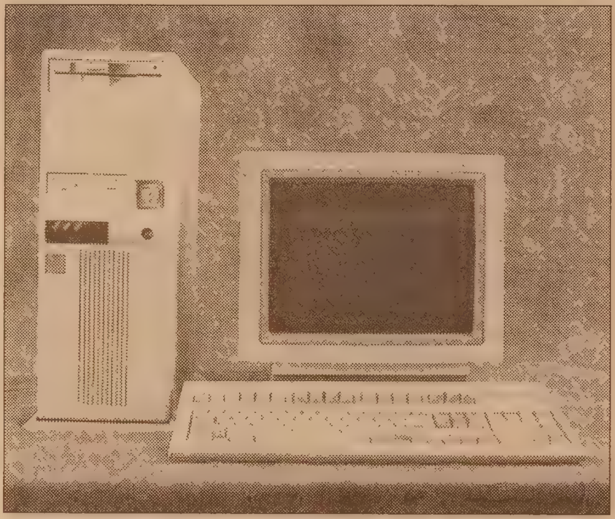

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Hard Drives/Controllers

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1.08GB 10.5ms IDE	$599.00

QUANTUM

1.08GB 10ms SCSI	699.00
270MB IDE	189.00

MAXTOR

540MB 8.5ms IDE	350.00
340MB 14ms IDE	219.00

CONTROLLER

VLB IDE w/ 2S1P1G Port	19.99
ISA IDE w/ 2S1P1G Port	14.99

Printers

HEWLETT PACKARD

LaserJet

4+ 600dpi, 12ppm, 2MB	$1399.00
4L/4P	669.00/979.00
4M+/4si	$1999.00/2995.00

DeskJet

520/560C-color	$299.00/559.00
1200C 6ppm, 2MB, color	$1429.00

OKIDATA®

ML395	988.00
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ML590/591	469.00/599.00

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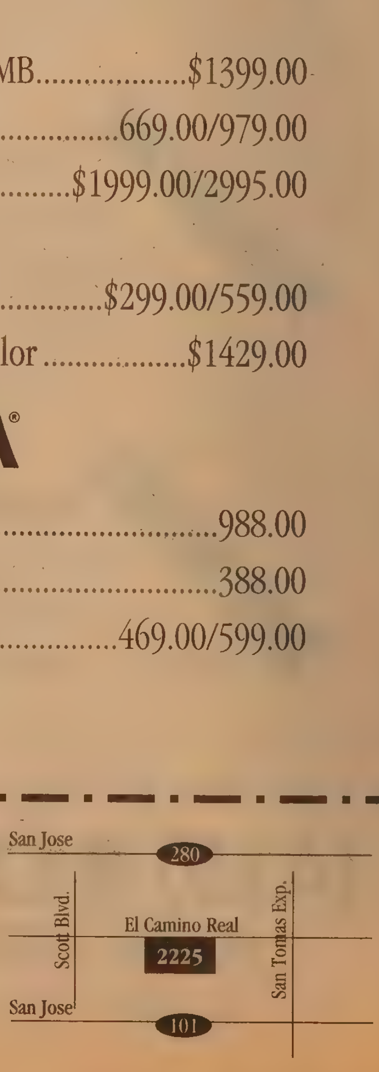

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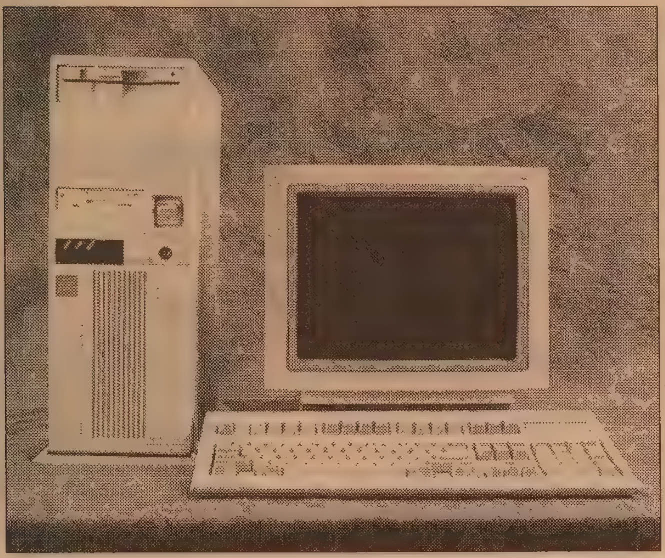
486 VESA LOCAL BUS SYSTEMS



Green VESA Local Bus

- Green VLB Motherboard
- 4MB RAM expandable to 32MB
- AMD DX2-66MHz processor
- 256K Cache memory
- 3 32-bit VLB expansion slots
- 3.5" 1.44MB floppy drive
- VLB IDE HD/FD controller
- 2 serial, 1 parallel & 1 game port
- Supports up to 32MB RAM
- Mid Tower w/ power supply
- 101-key enhanced keyboard

$695

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FAX PAPER **$2.99 ea.**

(FAP482)
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101-KEY KEYBOARD **$19.00 ea.**

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AT FULL SIZE DESKTOP CASE **$29.00 ea.**

(CAS214)
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GENOA VESA Local Bus

- GENOA 486VL Motherboard
- 4MB RAM expandable to 32MB
- AMD DX2-66MHz processor
- 256K Cache memory
- 3 32-bit VLB expansion slots
- 3.5" 1.44MB floppy drive
- VLB IDE HD/FD controller
- 2 serial, 1 parallel & 1 game port
- Supports up to 32MB RAM
- Mid Tower with power supply
- 101-key enhanced keyboard

$745

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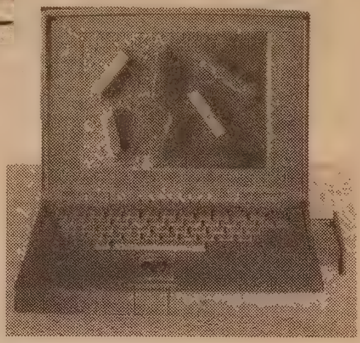


Step™ Note

Modular Notebook

- 4MB RAM expandable to 20MB
- 486DX2-50/DX-2-75 processor
- 2 PCMCIA II ot Type II slots
- Built-in speaker, microphone and trackball
- Multimedia, SoundBlaster Ready

DX2-50, 250MB HD, Passive Color	$2249.00
DX4-75, 340MB, Active Color	$3899.00

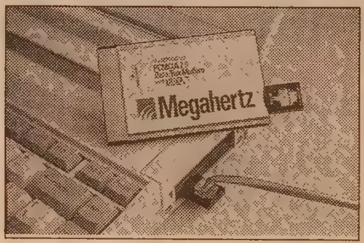
EPSON

Lowest Price Guaranteed!

ActionNote 400 Sub-Notebook

- 486SLC-33 processor
- 4MB RAM exp to 8
- 170MB hard drive
- Type II PCMCIA slot
- MS-DOS & Windows preloaded
- Ext. 3.5" floppy drive
- 1 year warranty

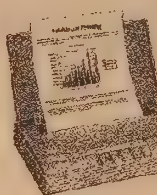
$1099



PCMCIA Cards

MEGAHERTZ	
2496	$89.00
XJack 1144	199.99
XJack 2144	269.00

EPSON	
9624 PCE24	69.00
14.4 ADC14	199.00



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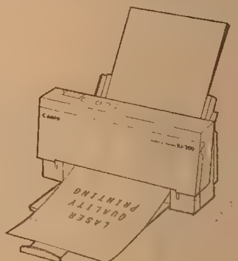
BJ-10ex Portable Inkjet

- Prints up to 84cps
- Weighs only 4 lbs.
- Black color only

$129*
* Refurbished Printer

Canon

BJ-200 Inkjet



- Prints up to 248cps
- 100-sheet feeder
- Optional ASI
- 90-day Warranty

$179*
* Refurbished Printer

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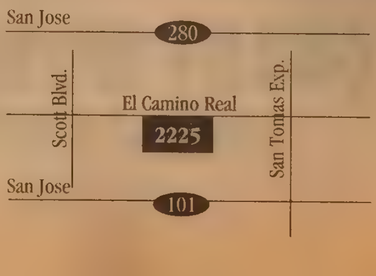

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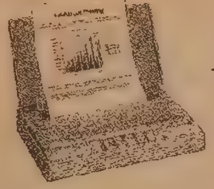
$30 Rebate*... on Printers & Scanners!

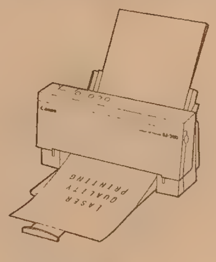


BJ-10sx Portable Bubble Jet Printer

- Prints 30% faster than 10ex
- Weighs 10% lighter than 10ex
- Text graphics up to 360dpi
- Uses plain paper & transparencies
- 2 year warranty

$219*

BJ-200e Ink Jet Printer



- 360dpi resolution
- Prints up to 248cps
- 100-page sheet feeder
- 7 resident fonts
- Hold up to 10 envelopes
- 2 Year Warranty

$249*

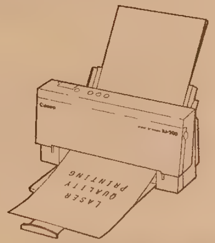
BJ-230 Wide Carriage..$369*

BJC-600 Color Ink Jet Printer

- 360 dpi
- 100-sheet ASF
- 240cps draft, 170cps high quality
- 16.7 million colors available
- 64 nozzles per color
- 2 year warrnaty

$549*

BJ-100 Inkjet Printer



- 140cps, 120cps
- 360x360 resolution
- 64 nozzles print head
- 100 sheet paper tray
- 2 year warranty

$199*

**$30 end-user rebate on selected models, thru 8-31-94*

AC Line Conditioner

Eliminates Surges & Spikes... with clean, steady power level

300VA	$29.00
500VA	$59.00
1000VA	$69.00

COMPUTER CASES

AT Full Size Desktop	CAS214	$39.00
Baby Desktop	CAS200	$49.00
Mini Tower w/ 200W	CAS3201B	$39.99
Medium Tower w/ 230W	CAS8922D	$69.00
Full Tower w/ 230W	CAS320	$89.00
Super Tower w/ 300W	CAS320S	$149.00

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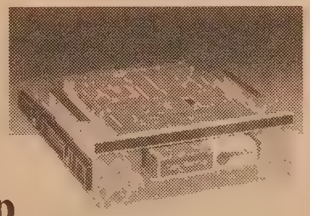

DJ-20 250MB Tape Backup

- Internal
- Runs off floppy port
- Uses 2120 tapes

$149.99

JT-20 250MB External Trakker $299.00

3M

DC2120
Tape Cartdrige
HTT2120

$10.99

3.5"

Formatted Diskettes
Sold in box of 25
XDM325

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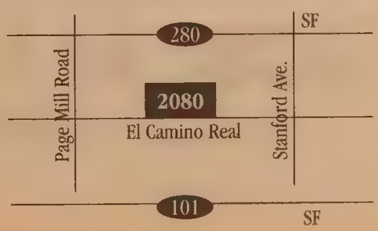

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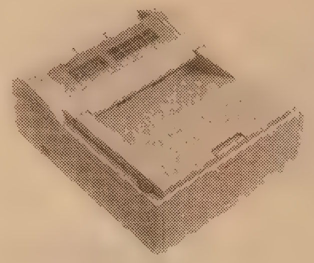


OL-400e LED Page Printer

- Compact Size and sleek design fits comfortably on any desktop
- Fast 4ppm printing with RISC microprocessor for higher productivity
- 44 fonts for great-looking correspondence and reports
- Perfectly compatible with virtually all software applications

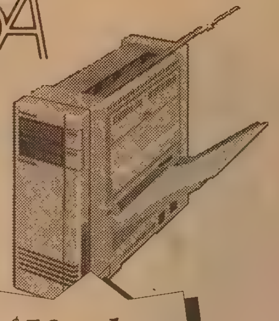
$479

OL410e

- 600 dpi resolution
- 4 ppm

$649

Panasonic Office Automation OA



KX-P4400 SideWriter Laser

- 4ppm
- 512K memory
- 300dpi resolution
- 100-sheet multi-purpose tray
- HP IIP emulation
- 1 year warranty

*$50 rebate and Free Toner**

$449*

KX-P5400

- 4ppm
- Postscript

$100 rebate and Free Toner

$749*

** enduser rebate thru 9/30/94*

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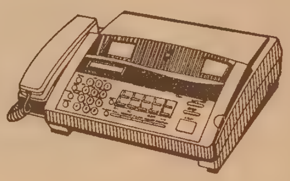
No-Curl!

950M Plain Paper Fax Machine



- 256KB memory
- Auto 30 page feeder
- 160 station memory
- On-screen programming

$578

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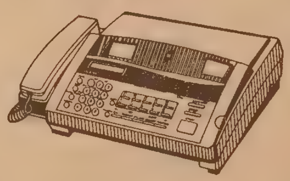
No-Curl!

780^{MC} Plain Paper Fax Machine



- Receives up to 50 pages in memory
- Auto 15 page feeder
- 16-digit LCD display
- Built-in answering machine

$398

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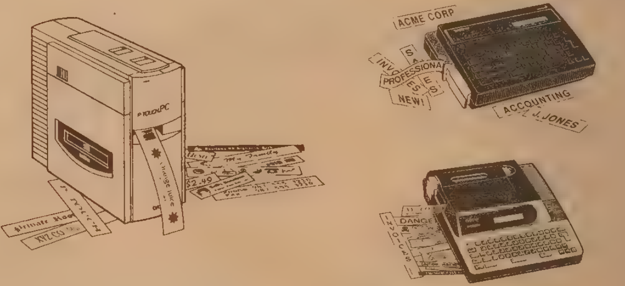
P-Touch Professional Labeling System

- Creates customized adhesive-backed label
- Different size tape from 1/4" to 1"
- Prints English or Spanish
- Battery operated or AC adaptor



PT-12	$109.00
XL-30 Prints Bar Code	$159.00
XL-35 With Case	$299.00
P-Touch PC	$249.00

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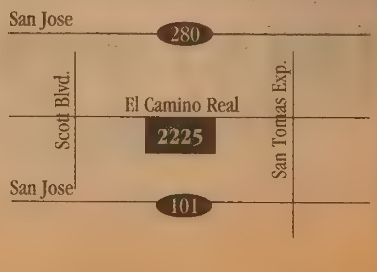

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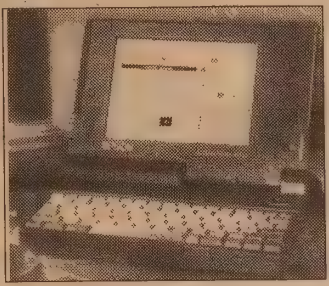
ActionNote 500C Color Notebook



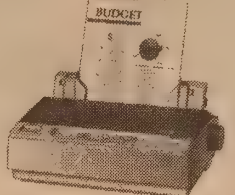
Color!

- 486 SLC-50MHz processor
- 4MB RAM expandable to 8MB
- 120MB IDE Hard Drive
- Passive matrix color display
- Built-in modem only
- 1 year road-site warranty

$1699

With 180MB HD..................$1899

Free!



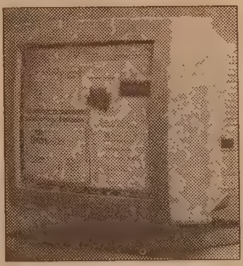
6" Printer Cable with EPSON printer purchase*

LX-300	$169.00
LQ-570+	$249.00
FX-870	$279.00

** on above printers only, no substitution, XCA006, limited to stock on hand*

Stylus 300 ***Inkjet***	$199.00
Stylus 800 ***Inkjet***	$259.00
DFX5000 ***high speed***	$1350.00
DFX8000 ***high speed***	$2299.00
ActionLaser 1500 ***Laser***	$678.00
Action Laser 1600 ***Laser 600dpi***	$995.00

14" SVGA Monitor



- 14" SVGA monitor
- 1024x768 resolution
- .28mm dot pitch

MTE14 **$219**

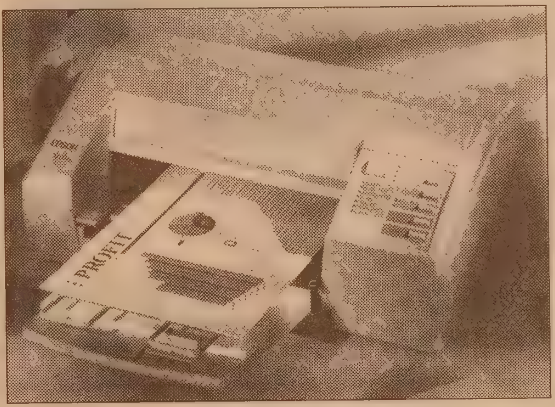
Dual Floppy Drive

Limited Drive Bay Solution!

- 5.25" and 3.25 in one
- 42.8mm height
- 500Kbit/sec tranfer rate

$79.99 DFS0305

Stylus COLOR Color Ink Jet Printer



- 720x720 max resolution
- 48 nozzles per color
- 240 cps @ 12 cpi
- 5 bitmap, 4 scalable font
- 2 year limited warranty

New!

$599

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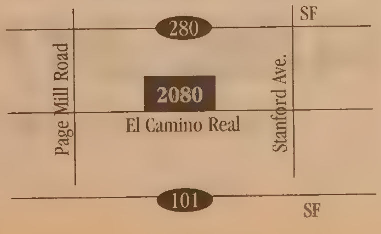

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Featuring NEC 3Xi Triple Speed CD-ROM Drive, 3D Sound Card and 15 popular CD-ROM Titles!

The Latest & Greatest of Multimedia!

- NEC 3Xi CD-ROM Drive w/ 195ms access time
- 16-bit 3D Sound Card
- Stereo Speakers and Microphone
- 15 CD Title software

HDM5000 **$679**

Premium Deluxe Multimedia Kit

Featuring Reno Drive with 3-D Sound Card!

The Perfect Multimedia Kit!

- Media Vision portable Reno Drive
- 16-bit 3D Sound Card
- Speakers, case and Microphone
- 15 CD Title software

HDM4000 **$499**

MEDIA VISION

Pro 16
Multimedia System

- NEC 25p CD ROM Drive
- ProAudio Spectrum 16
- Microphone, SCSI IF
- 8 CD Software titles

ADS212 **$399**

CD Titles

Microsoft Encarta	$89.00
The Family Doctor	25.00
Jones In The Fast Lane	21.00
Mixed Up Mother Goose	18.00
Toolworks Encyclopedia	29.00

CREATIVE
CREATIVE LABS, INC.

Edutainment CD 16
Internal Multimedia Kit

- Dual Speed CD ROM Drive
- SoundBlaster 16
- Stereo Speakers
- 8 CD Titles

$369

Discovery CD16 Kit	$299.00
SoundBlaster 16 Value Edition	$99.00
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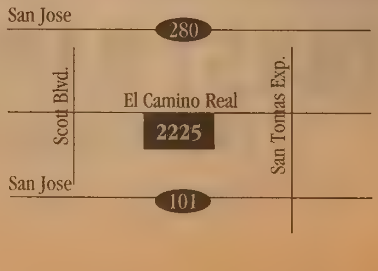

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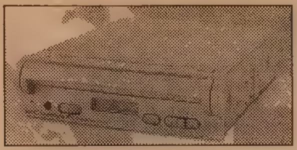


Triple Speed CD ROM Drives

3xi, internal	$388
3xe, external	$469
3xp, portable	$389

MultiSpin 4x Pro

Quad-Speed
CD ROM Drive

just arrived!

- 180ms access time
- 600 kbytes/sec data transfer rate
- 256 kbytes memory buffer
- 44.1 KHz Frequency for Audio
- 2 year limited warranty

$899

PHILIPS

Internal CD-ROM Drive
with Driver, interface
and Cable

HDP205 **$69**

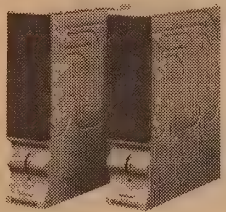
MITSUMI

Internal Double Speed
CD ROM Drives w/ interface
250ms Access Time

HDM001 **$129**

Speakers

Panasonic EAB710P



- 14 watts power output
- Acoustic-maze design
- Compact design

$159.99

EAB401P	**$59.99**

Labtec SS-700 Amplified Speakers

- Built-in equalizer
- Individual volume control
- 4 watts power output

$29.99

ASL-800	**$33.99**

Keyboards

NMB 101 Key w/ PS/2 connector	15.00
ACER 101-Key w/ PS/2 connector	19.99
MITSUMI 101-key	29.00
KEYTRONIC 101-key	39.00
MAXISWITCH Pro-II 124-key Programmable	69.00
PROXELLENT ProX-121 Programmable	69.00
FOCUS	
8000 101 Key w/ Calculator	49.00
2001 101 Key w/ Calculator	39.00
9000 129 Key w/ Calculator, Programmable	59.00
NORTHGATE	
OnmiKey 101-NI/102	$89.00
OmniKey Ultra T	$109.00

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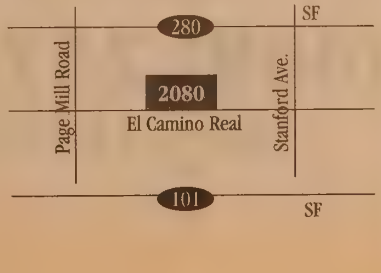

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The 14.4 Fax Modems

- Internal PC version
- V.42/MNP5
- Easy installation
- 5 year limited warranty

$99.99

External	129.99

ORCHID

Kelvin 64
2MB VRAM

ADN342V $179

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Worlds Fastest Graphic Accelerator

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HERCULES
DYNAMITE PRO

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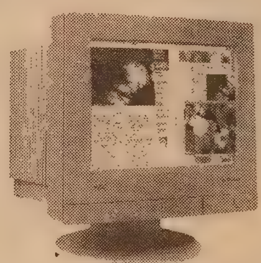
ADN402 $229

NEC



MultiSync Monitor 2V

- 14" non-glare screen
- 1024x768 resolution
- .28mm dot pitch
- 2 year limited warranty

$339

Professional Series

5FGp 17" 1024 .28	$1129.00
6FGp 20" 1280 .28	$1999.00

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PC WORLD
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PC

Graphic Ultra Pro

- 2MB VRAM VLB
- Non-interlaced 1280x1024
- Multiple Bus support
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DIAMOND
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SPEEDSTAR PRO

1MB VLB	$119.99

VIPER VLB

2MB VRAM	$335.00

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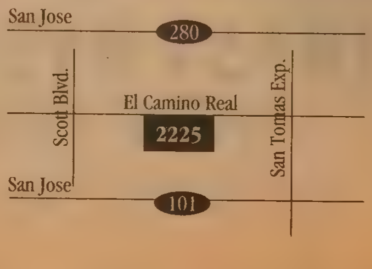

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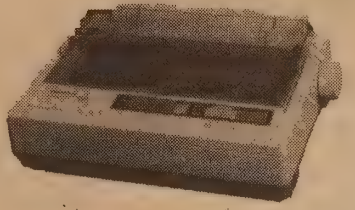
Panasonic Office Automation OA

KX-P2023

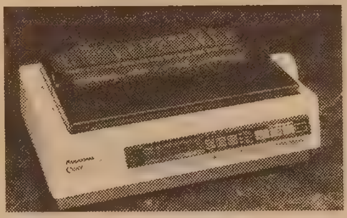


- 24-pin quiet printer
- 240cps
- 7 built-in fonts

**Remanufactured printer*

$149*

KX-P2123



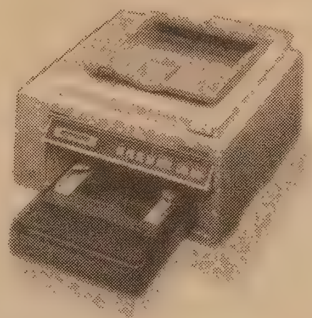
- 24-pin quiet printer
- 240cps, 80cps LQ
- 6 built-in fonts

**Remanufactured printer*

$179*

KX-P2023	$199.00
KX-P2123	239.00
KX-P2124	319.00
KX-P3624 300cps	399.00
KX-P4410 Laser	449.00
Toner for 4450/4450i/4455	53.90
Drum kit for 4450/4450i/4455	225.00

KX-P4410



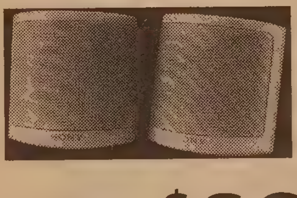
- 5 ppm
- HP IIP emulation
- 512K exp to 4.5MB
- 200-sheet multipurpose tray

**Remanufactured printer*

$399*

SONY

SRS-PC30 Active Computer Speakers



- Built-in amplifiers
- Bass boost switch
- Monitor mounting kit
- AC power adapter
- 3 watts power output

$66

15" Trinitron Color Display MultiScan 15sf

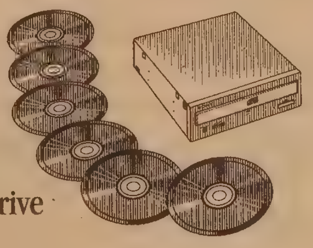
New!

- 14.0" Max viewing area
- .28mm dot pitch
- 1280x1024 resolution
- 50-120Hz refresh rate
- 3 year warranty

energy EPA POLLUTION PREVENTER

$449

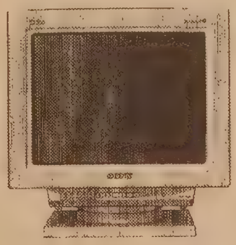
Desktop Library



- Sony Dual speed CD ROM drive
- 16-bit stereo sound card
- Sony shielded speakers
- 6 popular CD titles

ADS220 **$399**

GDM-17SE 17" Trinitron Display



energy EPA POLLUTION PREVENTER

- 1600x1200 max resolution
- 25mm dot pitch
- 50-150Hz refresh rate
- Energy Star compliant

$949

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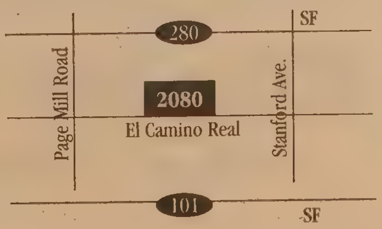

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SPEAKERS

Multimedia Speakers	$4.77
Labtec CS-1000 System	$69.00

MULTIMEDIA KITS

Media Vision

Multimedia CD 16	$189.00
Pro 16 System ADS212	$399.00

Creative Labs

Edutainment CD 16 ADS120	$359.00

CD ROM Drives

Texel Double Speed CDT3021	$109.99
Toshiba Double Speed HDT34011E SCSI	$289.00

SOUND/VIDEO CARDS

Media Vision

Pro Audio Spectrum 16 ADS207	$89.00
Pro Movie Spectrum ADS216	$69.00
Pro Movie Studio ADS005	$159.00

MISCELLANEOUS

ALL TEMPLATES - 30% OFF

Cleaning Kit XSP006	$4.99
Headphones ADS801/ADS808	$1.49/$19.99
Serial Mouse PMS003	$4.99
Ext 96/24 Fax modem by WANG ADF92WE	$28.99
Cordless mouse PMS010	$19.99
Keyboard Drawer XSP012	$19.99
The Complete Communicator PHC105	$65.00
Panasonic Printer Fonts PTP9062/9064	$29.00
Memory Expansion for HP Printers PDP060	$39.00
CLA for Motorola Flip phones GDP111	$12.99
Paper Shredder 36070	$89.99
ToteVision HF200 fax machine Demo	$99.00
Co-Star Address Writer PTC001 Demo	$275.00
SyDOS Removeable cartrige drive HDS441	$149.00

NOTEBOOKS

Canon NoteJet.... Notebook & Printer In One!

486SX-25 4/120 Passive Color	$2295.00
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AVANTI

486SLC-25 4/120 w/ 9624 Fax	$1699.00
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These offers are available in our Santa Clara location only.

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Generic CADD SSD11707	$169.00
MS Arcade SSZ105	$24.99
PrintCache SSHD01	$29.99
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14" & 15"

Abonite Color VGA MTN439	$149.00
Standard Technology 428C-VESA	$229.00
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17"

Nanao F760i-W 17"	$1699.00
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Epson ActionLaser 1000 Laser Demo	$488.00
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Star SJ-144 Color Thermal Demo PTS144	$339.00
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KX-T3910 Cordless PHP3910	$89.99
KX-T1450 Stand Cassettes PHP1450	$49.99
KX-T2100 Dual Micro Cassettes PHP2100	$59.95
KX-T8000 Digital Recording PHP8000	$129.98

BELLSOUTH

699 10-channel cordless PHB699	$79.99
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465 10-memory big button phone PHB465	$17.99
433 Slim Line Phone PHB433	$14.99

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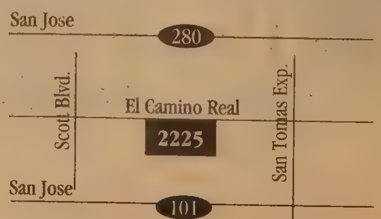

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DX2-50 MHz	4MB RAM, 209MB Hard Drive	$3999*
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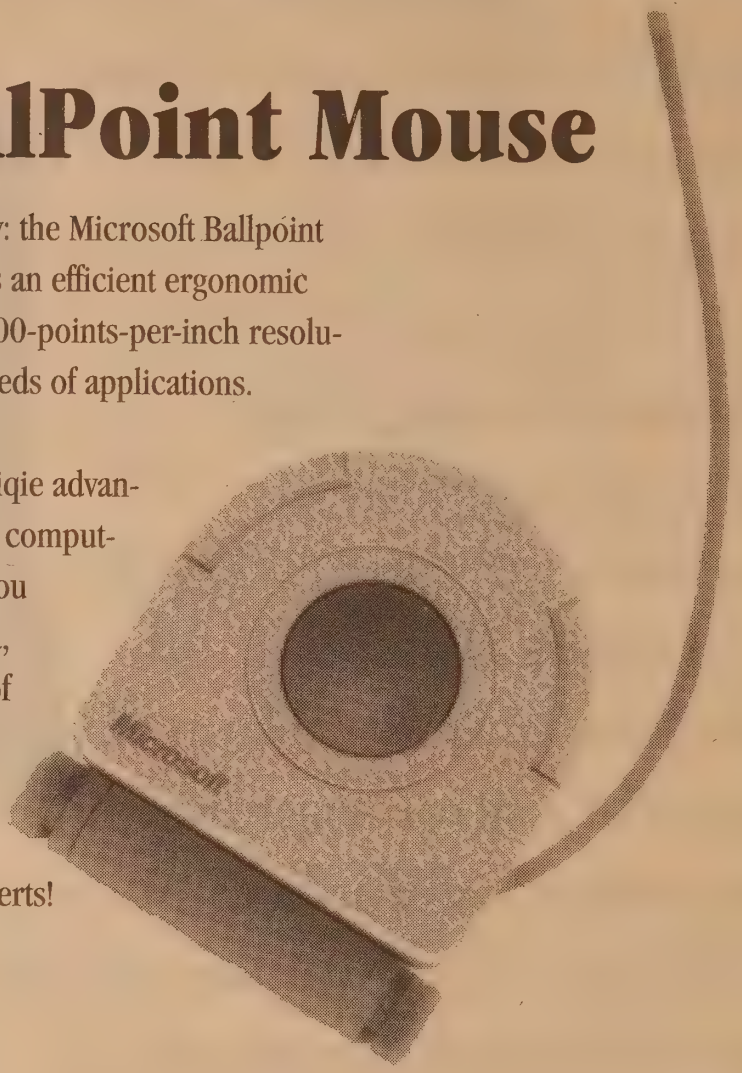
NEC

Microsoft® Mouse

Created for notebook and desktop computers, the Microsoft Ballpoint mouse has a revolutionary design that's ideal whenever space is at a premium. Set it next to your keyboard and get the same high resolution performance as the best-selling Microsoft Mouse.

Microsoft® BallPoint Mouse



Meet an exciting member of the Microsoft family: the Microsoft Ballpoint mouse. Like the popular Microsoft Mouse, it has an efficient ergonomic design, adjustable acceleration and sensitivity, 400-points-per-inch resolution for pinpoint control, and support for hundreds of applications.

But just one look will tell you this mouse has uniqie advantages. It brings mouse-driven computing to your computer. Set the mouse to the left or right - whatever you prefer. The Ballpoint mouse can also be lowered, swiveled in, out or up to maximize the comfort of your hand.

The Microsoft Ballpoint mouse: It's a sensational innovation from Microsoft, the mouse experts!

Ready...

Tilt...

Swivel!

Microsoft® BallPoint Mouse **$19.99**

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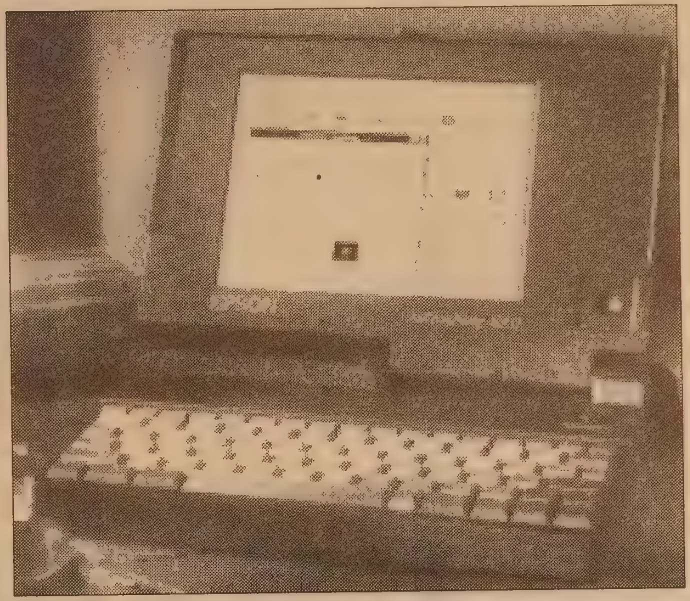
Good Things Come in Small Packages...

- **Powerful performance in a small package**
  - Fast: 486SLC/33MHz microprocessor
  - Lightweight: 3.85lbs., including battery and hard disk drive
  - Small: 1.5" x 7.6"
- **High-end features that doesn't cost extra**
  - Type II PCMCIA slot for PC cards
  - Built-in trackball
  - External 3.5" floppy disk drive
  - Removable 170MB hard disk drive
  - Attractive carrying case
  - MS-DOS & Windows pre-loaded
- **Expandability**
  - 4MB RAM, expandable to 8MB
- **Bright, easy-to-read screen**
  - Backlit, 7.5" monochrome VGA
  - Dual display for an external monitor



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Networked Communities: Real or Virtual?

It Is Hard To Find Anyone Who Uses Only A Single Medium For Communication

BY JOHN S. QUARTERMAN

I hear much talk of virtual communities online, virtual communications, virtual relationships, etc. Anything that involves use of computer networks seems to have taken on the adjective "virtual".

Personal Communications

I passed through Boston a few weeks ago—famous for arts, culture, and high-tech industry; people there brag about the number and quality of its universities. I stopped to see Peter Salus, who knows a dozen languages, writes books, has been a college dean in his time, and goes to the opera and the symphony.

I asked him, "Do you communicate with more people online, or here in Boston?"

He said, "Online, of course."

So I said, "Which kind do you see more of in person in a year?"

"People I usually communicate with online."

"And in a month, in a week? How small do you have to shrink the interval until you see more people who live right here in Boston than people you know over the net?"

"Why, never, no matter how small."

I don't think Peter's experience is all that unusual, even if he is more gregarious than most.

Even those who "see" more people face-to-face, perhaps due to participating in church, school, or community activities, they often use the net to keep in touch with people they would not otherwise. Even if most of these online correspondents are people who formerly lived in town, many of them wouldn't still be correspondents without the net.

Media And Community

Some people argue (somewhat confusingly) that online relations and communities are not real because they are not completely online. That people who communicate

Seybold San Francisco.
It promises to be a real eye-opener.

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online also use the telephone, fax, paper mail, and even meet face-to-face. And that therefore virtual communities aren't really online, only virtually online. The point of this argument that some people make seems to be that a community can't be real unless all the interactions of its members are conducted using the same medium, that a real online community must be completely online, apparently on the assumption that a real offline community conducts all its interactions face-to face, or at least through the same medium.

But it would be very hard to find a community that conducted all its interactions through the same medium. Even someone who lives in the same house their whole life is likely to give a birthday card to a housemate, or call a friend at work, or even see a relative on television. It is hard to find even a single person who uses only a single medium to communicate with anyone else anymore. It's not clear that anyone ever did, for that matter, at least not anyone literate since the invention of writing.

Work And Workers

Because of online communications I have been led by my friend Toru to the best spot to see fireworks in Tokyo; flown from Warsaw to Caracas to Houston to see many of the same people in different meetings on three continents in one month; and met many new people who, though of different nations, languages, religions, and educational backgrounds, understood each other because of their use of this technology. A network engineer in Cairo works, talks, and acts much like one in Tokyo, even if one is female, Muslim, and young, and the other is male, Shinto, and venerable. Users of network communications are perhaps more diverse, but the more they communicate online the more they gain certain expectations of convenience, speed, and geographic scope of communication.

Why does no one refer to a voice heard over a telephone as virtual?

Because of this technology I can work in Matsumoto, Buffalo, or Valdosta almost as well as at my office, and most people don't even know where I am at the time, nor do they need to. Because of this technology we can write a book in five months, not a year.

There is a downside. Diversity of contacts through networks can lead to difficulty concentrating on the task at hand; it's hard to get that book out in five months if you can't bring yourself to refuse flying to Prague in the middle. There is no longer any border between working hours and nonworking hours (except for dealing with those who still believe in the telephone). Housework may not get a lot of attention when you don't see the house much. And people not on the net tend to be uncomprehending, not to mention difficult to communicate with.

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Online And Offline

So networks are good for work. They are also good for play, too. Role-playing games with participants scattered across the world are common, and many people correspond for the amusement of it. Religion and philosophy get discussed online. Already some religions probably would not exist in their current form if not for networks. Sex is one of the most popular online topics, complete with quite graphic images. It's true it's difficult to actually hold a religious ceremony online or to have sex online, but these are activities that usually take place in specialized surroundings such as churches and bedrooms offline. People don't generally actually get married online, but they don't generally get married on the telephone, either.

Essentially any human activity can either take place online or be facilitated or caused by online activity. Where is the source of this stigmatization of networked activities as virtual, then? Some of it is probably just people (especially the press) latching onto a trendy word. Some of it is probably reaction to the huge amount of hype that has been printed and said about how networks will make everything so much better. But there seems to be more to it than that. Let's look at the example of work again in more detail.

Initiative And Interdependence

The prevalent model of work appears to be that of the corporation with its employees who go to a physical office and work eight hours a day, five days a week. While there, they work on small tasks handed to them by their superiors, and with workgroups assigned by those same bosses. But the 9 to 5 world of corporate America has never been the only model of work. Academics and farmers have always worked long hours according to projects and seasons, and the responsibility for who they work with and how is largely their own. Networks promote such independence of initiative together with interdependence of workers. Typing this article on an airplane, I start to send mail to someone to clarify a detail of an anecdote; because I know he reads his mail often I will probably get an answer within minutes. Then I remember I'm not connected here in the air. I could compose the message and send it when the flight arrives, but by then I'll be finished with the article. Why don't airplanes have serial ports or Ethernet connectors next to the headphone jacks at

There is a downside. Diversity of contact through networks can lead to difficultiy concentrating on the task at hand.

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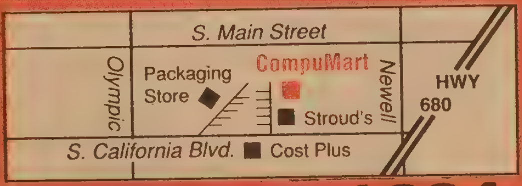

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endeavor, or if some or all of these competitors will align themselves and evolve a common, pervasive standard that will be usable across all networks and in every type of device. In any case, General Magic's products are one of the five enabling pieces needed for pervasive mobile computing use.

Piece Number Two

In November 1992, when RAM Mobile Data announced the commercialization of its wireless data network, one of the companies that accompanied them at the announcement was a little start-up called RadioMail Corporation.

RadioMail is an important piece in the puzzle of information providers. RadioMail may not, in fact, be the only company that will provide the following services, but it is certainly the one that has a vision of what is needed. It has forged ahead to provide a working system model that is up and running today. The RadioMail system provides a number of the services that will ultimately be required, and it is available with both the ARDIS and RAM Mobile Data networks.

What is RadioMail?

If the wired and wireless communications links are the pipes through which information is sent, RadioMail represents the reservoir and the switching station or the post office that controls the information put into the pipes.

One of the challenges of untethered communications is how to get to all the information that resides somewhere. Users might use MCI Mail and their own office e-mail system and want access to additional information services.

One way for communications providers to supply users with access to all this information is for each provider to contract with each and every type of information supplier that offers service and then find a way to connect users to each of these services on demand.

The RadioMail concept is that it will serve as the one system that will connect to all information suppliers. At present, it provides direct RadioMail-to-RadioMail connection to wireless users over RAM, ARDIS, and the Internet. It also provides connections to most of the other e-mail providers. If a user knows a person's address and mail system, the user can get messages to him or her over RadioMail.

Each mail service and information supplier uses different protocols and different formats for address and header information. A company such as RAM or ARDIS, in order to make available all the various services required, would have to provide translators between their own protocols and those of all the information and e-mail suppliers.

Enter RadioMail

Instead, with a single connection to RadioMail, all the information sent and received over the RAM or ARDIS network, in their specific formats, is received at RadioMail. The address of the intended recipient is determined, the service over which the information needs to be sent is determined, and the formatting and proper protocol conversions are applied. The message is then sent on its way.

RAM and ARDIS only need to establish one connection—to RadioMail. RadioMail, in turn, connects to MCI, AT&T, AppleLink, in-house e-mail systems, wire services for news, and all the other information suppliers.

End users are also enabled by RadioMail. Since RadioMail has (or will have) made all the wired and wireless connections, users can connect to RadioMail over any number of different wired and wireless options. The system will "recognize" the users and provide them with their own mail, and with other information to which they have subscribed or which is offered over the system.

RadioMail uses a store-and-forward method of messaging. Therefore, if a user connects to RAM in Los Angeles and sends half a dozen e-mail messages, when he or she steps off a plane hours later in New York and signs on to RadioMail again, replies and any new mail that is being stored is automatically sent to the handheld system.

All the features of RadioMail are not yet available. When one is mobile, one can send and receive intra-RadioMail messages using RAM or ARDIS and RadioMail. Users can choose to forward their MCI Mail to RadioMail so they can receive those messages while mobile. When they are in the office, they can reverse this process and forward their RadioMail to MCI Mail. More capabilities are forthcoming in short order. The folks at RadioMail understand the needs and wants of mobile people and have made great strides in providing all the services they will require.

RadioMail also provides NewsFactory and RadioFax. Soon it will be able to provide connections to office e-mail systems and to AT&T Mail, MCI Mail, hotel, restaurant, and airline reservation guides, stock market updates, and other services. Once a connection to RadioMail over any of the wireless carriers or over a wired link has been established, all such services will be instantly available, sent in a single format and protocol. If users want RadioMail to activate their pagers when it receives a message, it can provide this service. It will connect to the pager service and send a code, or even a digital message, notifying users of what is waiting for them in this information

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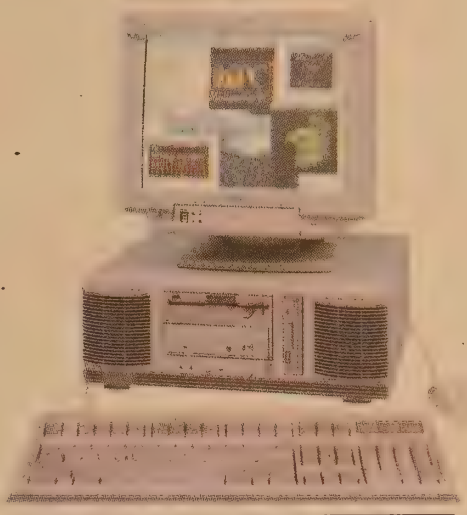

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repository.

RadioMail, then, is piece number two in the puzzle that is fast becoming mobile information access.

Moving Information

Piece number three, the ability to move information intelligently from one platform to another, is furnished by two different companies. One provides file-level capabilities and one builds on this, moving to record-level information exchange as reconciliation.

Traveling Software has been providing users with the ability to move program and information files from the desktop to portable computers for a number of years. The program, LapLink, is in use all over the world, and LapLink's multi-headed cable which enables connections between various desktop and portable computers is familiar to many who have been using portable computers.

Over time, LapLink has developed the means to provide users with the ability not only to move programs and files from one platform to another, but also to synchronize these files. A user can dial in, or direct-connect two computers via LapLink, ask the program to merge the contents of two sub-directories, and make them the same on both machines. Future enhancements will include capabilities well beyond those currently supported and will provide more levels of file synchronization than at present.

For users of wireless mobile computers, the ability to connect to their own computers and retrieve entire files is important. Making sure that the file on the mobile computer is in fact the latest version of the file is critical to the success of mobile computing. For example, if a presentation has been modified and updated, the user needs to know that his or her version is, in fact, the most recent one. LapLink supplies this type of "smart" data transfer and is, therefore, half of our third puzzle piece.

In addition to Traveling Software's LapLink Professional product, several new companies have emerged with products that perform the same basic functions, but in slightly different ways.

One such company is Nomadic Systems, Inc., and its product is called "SmartSync." It is designed to enable a number of different Windows-based computers to contain identical data. The main difference between this product and the one offered by Traveling Software is that SmartSync does not send and receive all files residing on two computers. Rather, it "looks" at each file and sends only the changes to the other machine.

Yet another entry into this product group is the "AirCommunicator" by a company called AirSoft. It too is designed to provide file access and synchronization between computers. But this offering was designed from the beginning to make use of wireless packet systems. AirCommunicator permits a remote user to access all the files on a desktop or network system, and stores the directory of that system on the remote device. The user paradigm is to select the desired file by choosing it on the local system. The wireless connection retrieves the file.

Operating Systems and Transfers

Some of the new mobile computing operating systems will offer transfer capabilities built directly into the operating system. Microsoft's "WinPad" and General Magic's Magic Cap are two examples. Further, when coupled with the capabilities provided by the company discussed below, end users will have a viable, robust method of not only moving files from one platform to another, but also of ensuring that all the information is up-to-date, and that there are no conflicts.

The second level of file and data movement is provided by a company called IntelliLink. IntelliLink has gained a reputation within the handheld computer market for understanding that it is often important not only to be able to send and receive entire files, but to work with information within a file.

Its present product offering permits users to connect any one of a number of different handheld computers and electronic organizers to a desktop system and move their calendar, to-do list, phone book, database, and memos between the two platforms.

The program does not stop there, however. In moving a calendar from any one of a large number of desktop Personal Information Management (PIM) applications (Lotus Organizer, Polaris PackRat, Borland SideKick, Arabesque ECCO, and more) to any number of handhelds including the Casio Boss family, Sharp Wizard, HP 95LX, 100LX, and more, it "looks" at each entry and combines the two files into one. If a user has entered a new appointment on his or her HP 100LX and his or her secretary has entered a new one on the desktop for the same time and date, the IntelliLink program will "find" this conflict and present it on the screen so that the user is aware of the conflict and can take action to resolve the problem.

Likewise, if an address book is moved from one platform to another, the user can be assured of always having the latest version. New entries added on both the desktop and the handheld program will be merged. Field mapping is also provided. When a user opens IntelliLink and chooses the desktop PIM or database and the handheld device that is being used, if the handheld device includes a PIM in ROM, the IntelliLink program will permit the "mapping" of each data field to the appropriate field in the other device.

If the desktop has a database that contains many more fields than are needed on the handheld, the user can map only the ones necessary, leaving the others intact in the desktop database.

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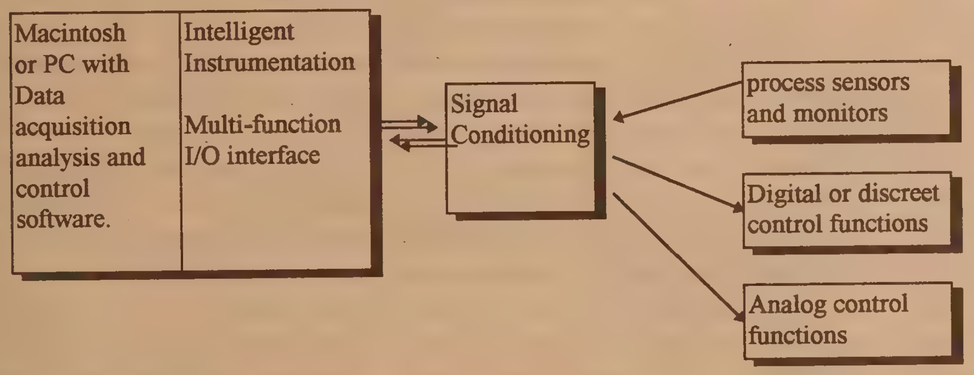
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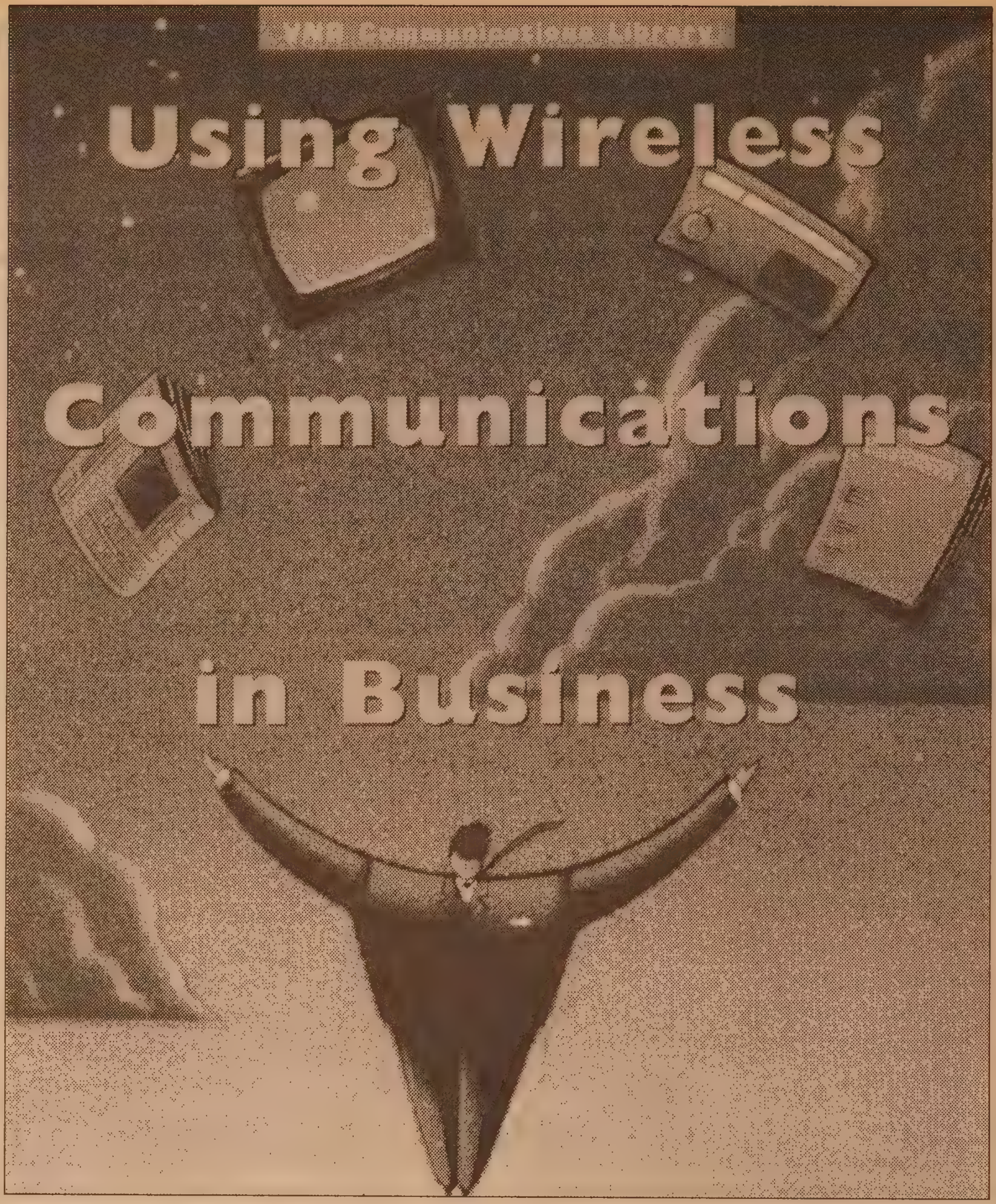
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advances, the ability not only to move data, but to reconcile it, will become more and more important. If a user is sent a new appointment over a pager (which is connected to a handheld or embedded into it), IntelliLink will enable it to be analyzed and sent directly to the calendar. At the same time, it will check to see that no conflict exists.

IntelliLink is also useful for its ability to move files from one program to another and from one organizer to another. When switching from PackRat to Lotus Organizer, for example, IntelliLink can transfer all the data. Not only is this done quickly, but since IntelliLink "knows" both systems, it is able to convert the information into the proper new format and place each piece of data into the proper fields in Organizer.

Likewise, when moving a database from one handheld to another, IntelliLink permits moving the data easily and without having to export from one file structure and import into another.

The "smarts" in the IntelliLink package will begin showing up in more and more products and, in conjunction with Traveling Software's LapLink and the other two pieces mentioned above, it will go a long way toward providing seamless information exchange between many different platforms.

The Fourth Piece

Another piece of the picture is the ability to "find" people no matter where they are and no matter what system they use for mobile computing access. In its simplest form, it might be referred to as an e-mail equivalent of the phone company's "one-person, one-number" concept.

This identification system, promised soon, will require pieces of hardware and software to be installed in all the major components of the networks. A portion would be embedded in the mobile computing device, a portion in the hosts or desktop systems that will be communicating with the mobile computers, and a portion in the networks that will be providing the services.

Part of this new technology will allow existing desktop or system-related applications in a mobile environment to be enabled without the need to rewrite them. The most important part, however, will be a common user Identification number (ID). This ID will permit enabled users to "find" any other enabled users no matter which of the many communications networks they are using, and even if multiple networks are used. In reverse, it will enable end users to enter wired and wireless systems from any point—through any of the available services—and to be "found" by the system. This will permit users to receive information that is being stored while waiting for them to access the network.

Like a Cellular System

The new technology that is needed might be likened to today's capabilities on the cellular network. A user who leaves the home service area is still able to make and receive calls in other areas. At the end of the month, one bill is received from the home area cellular provider. The other providers that have been used "know" where the user belongs and have forwarded the charges incurred to the "home" provider for inclusion in the normal bill.

Many cellular systems (but not all) are capable of locating users and, therefore, someone calling on a normal cellular number can be automatically switched to the area in which the user is located. The "enabler" in this type of cellular technology is the identifying cellular phone numbers. The cellular carriers' switching computers are able to "talk" to other carriers' computers to track us down.

These principles will soon become a model for the same type of inter-network communications in both the data and mobile computing arenas. When the system concept for such a one-number, one-person data system and software-enabling technology is implemented, the goal of go-anywhere, do-anything computing will be much closer to being achieved.

The Final Piece

Wireless data transmission methods will not be widely accepted until a high level of data security can be assured. On January 12, 1994, National Semiconductor (NSC) announced what it hopes will become a widely accepted and pervasive method of providing security for data. It will not protect those who discuss sensitive information over a cellular voice phone, but it will certainly handle the data portion of the equation.

There is a growing need to provide secu-

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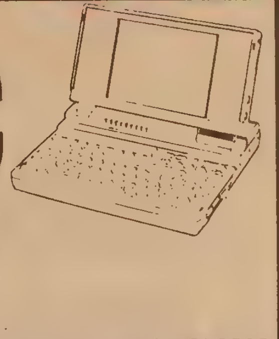

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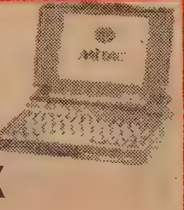

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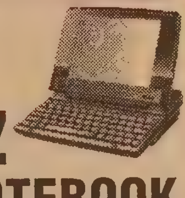

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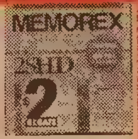

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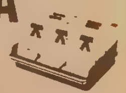

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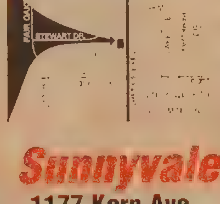

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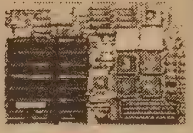

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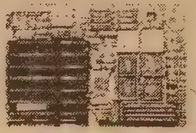

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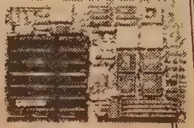

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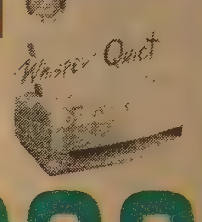

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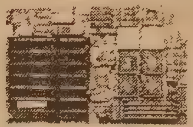

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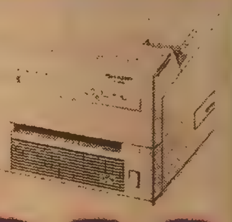

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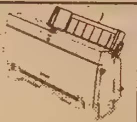

The Apple® StyleWriter® II printer, laser-quality printing at an affordable price.
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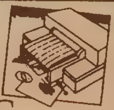

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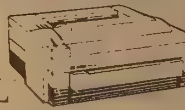

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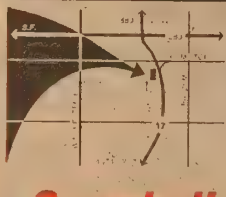

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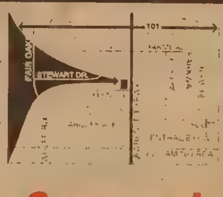

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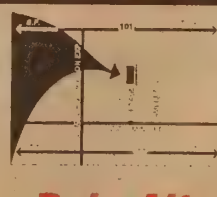

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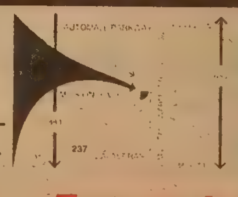

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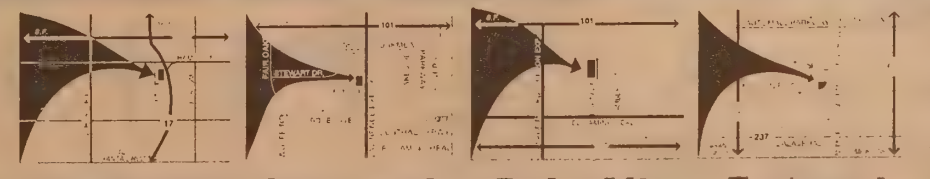

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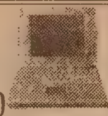

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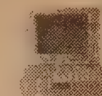

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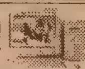

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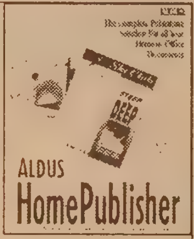

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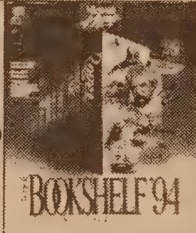

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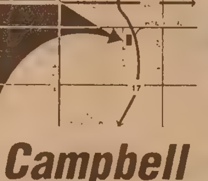

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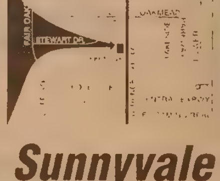

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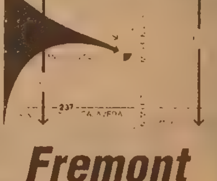

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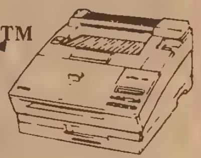

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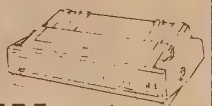

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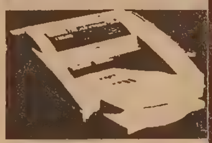

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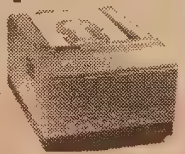

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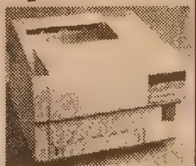

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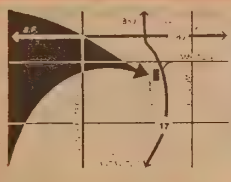

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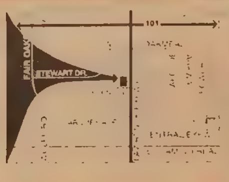

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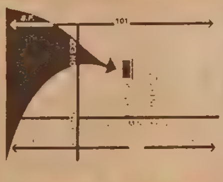

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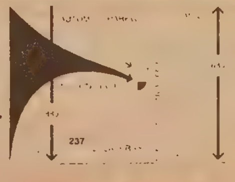

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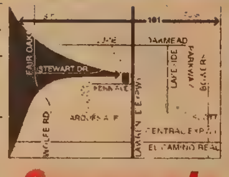

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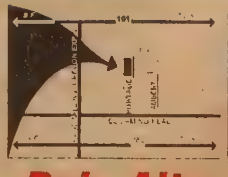

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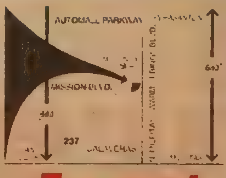

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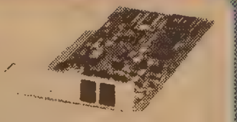

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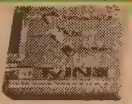

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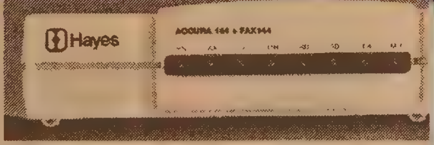
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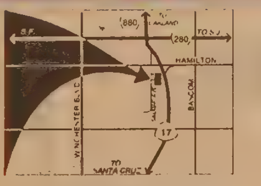
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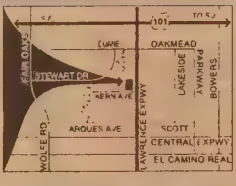
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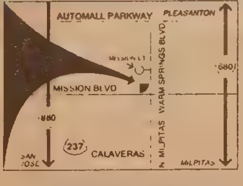
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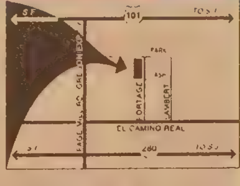
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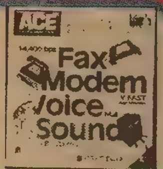
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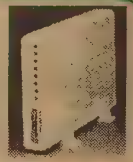

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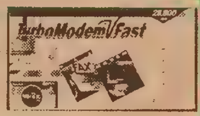
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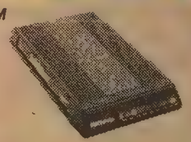

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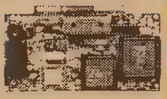

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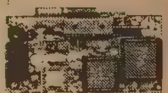

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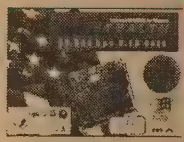

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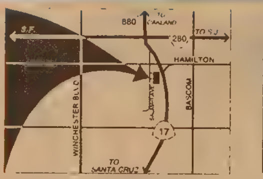
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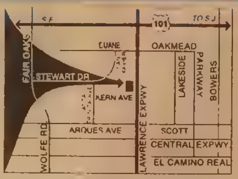
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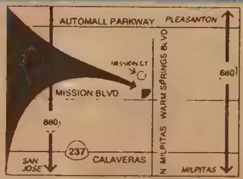
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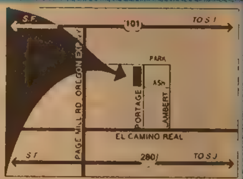
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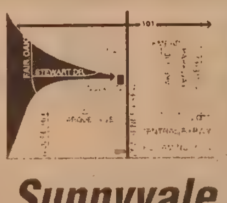

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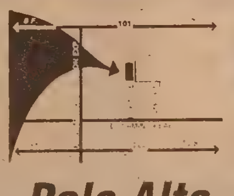

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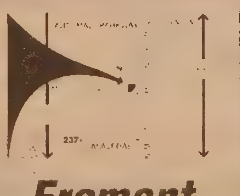

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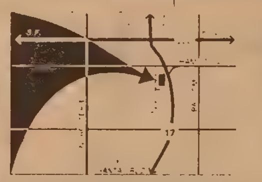

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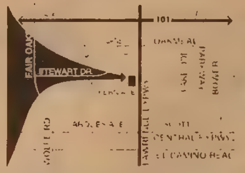

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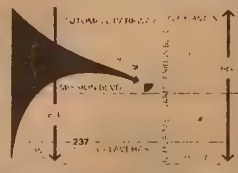

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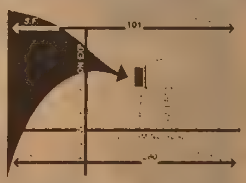

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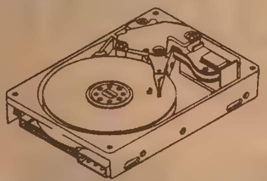

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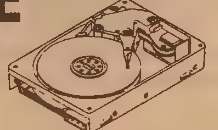

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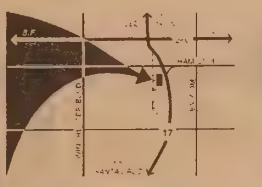

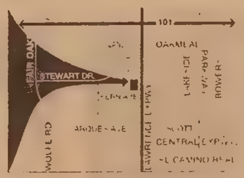

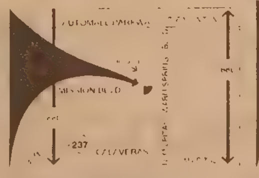

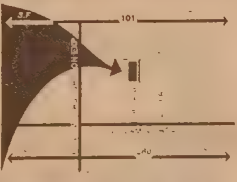

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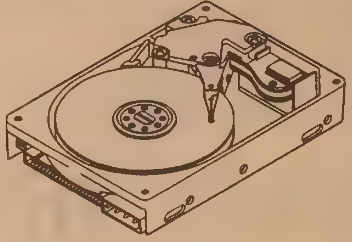

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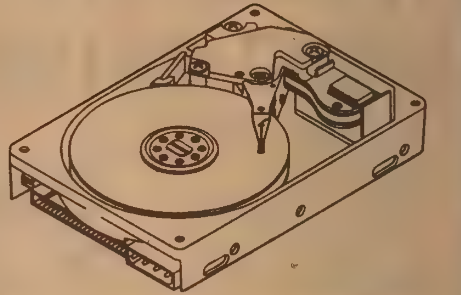

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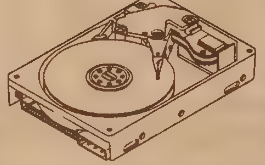

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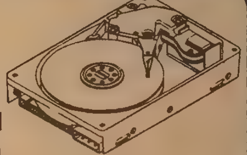

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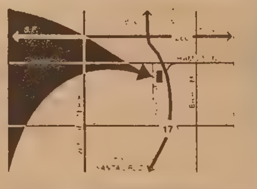

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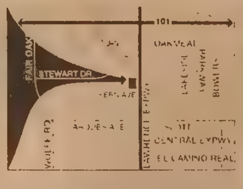

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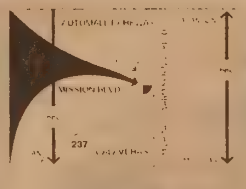

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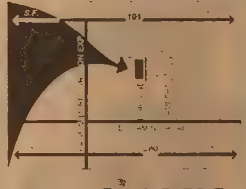

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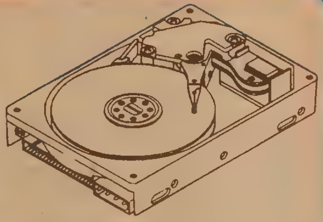

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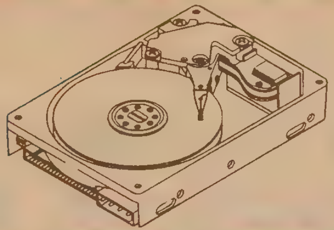

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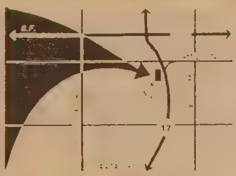

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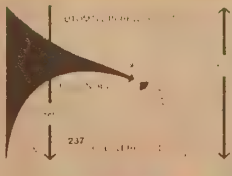

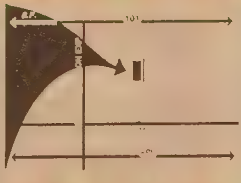

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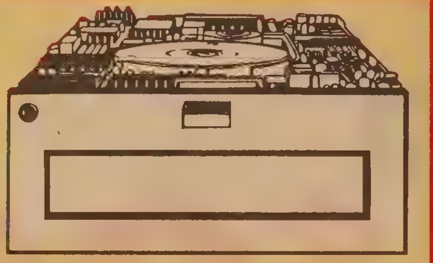

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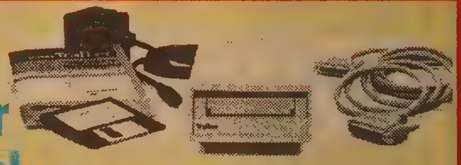

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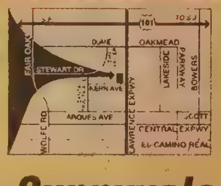
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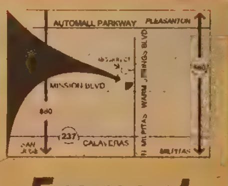
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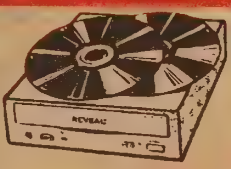

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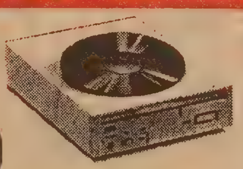

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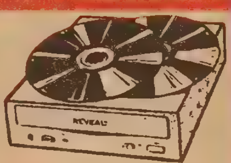

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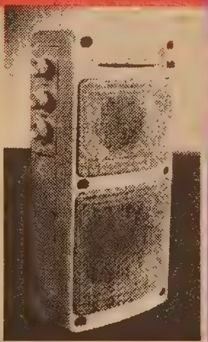

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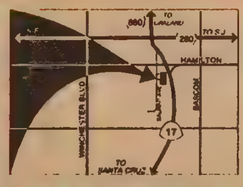
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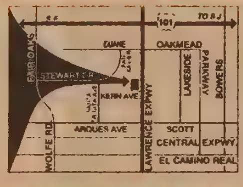
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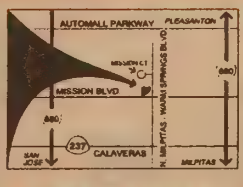
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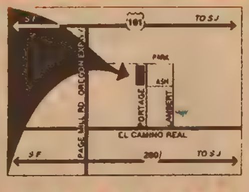
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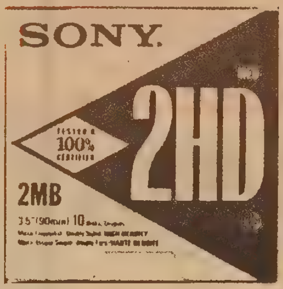
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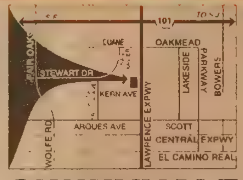
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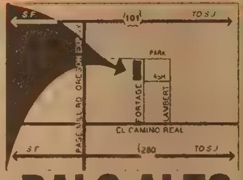
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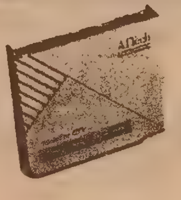

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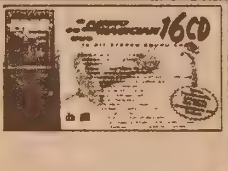
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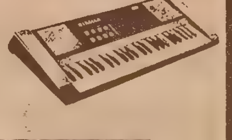

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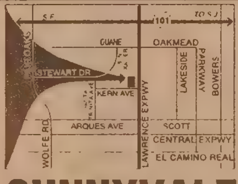
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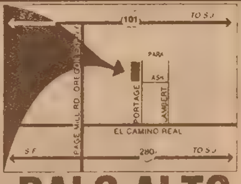
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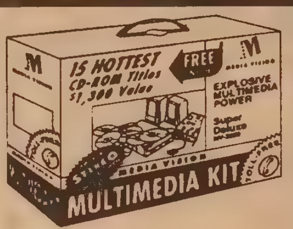

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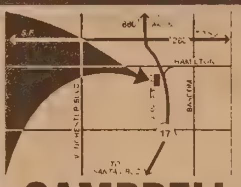

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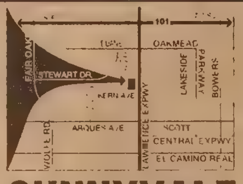

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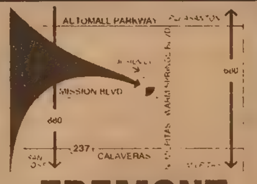

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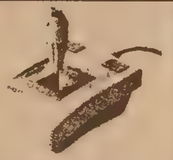

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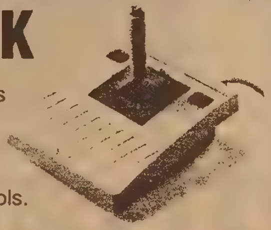

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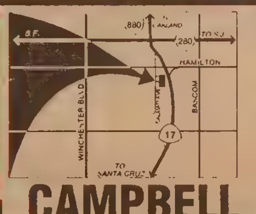
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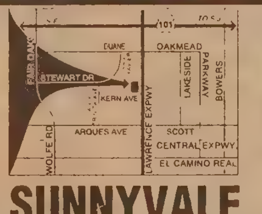
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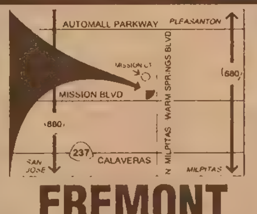
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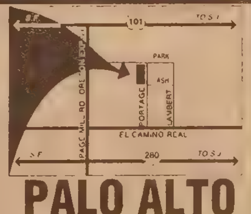
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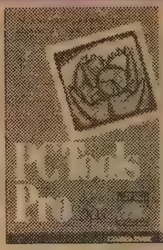

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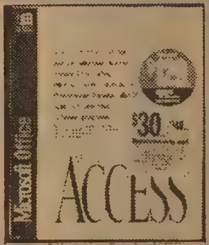

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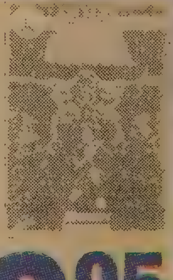

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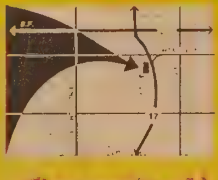

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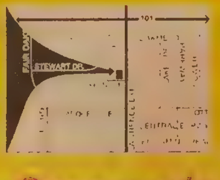

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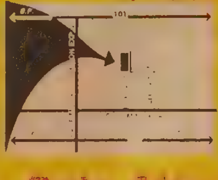

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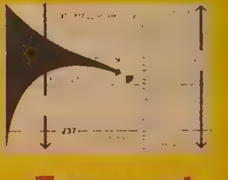

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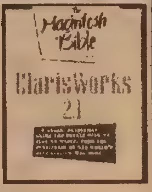
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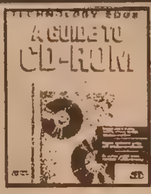
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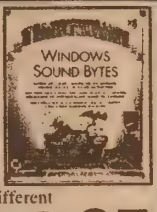
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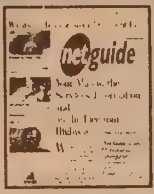

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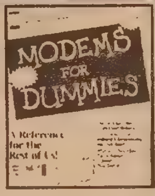
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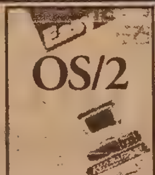

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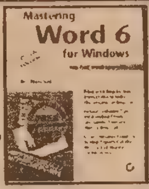
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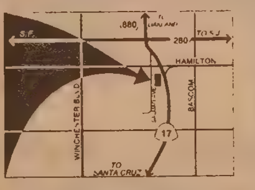
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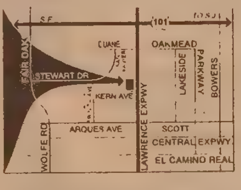
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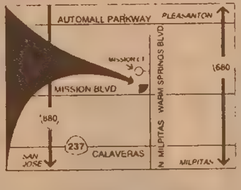
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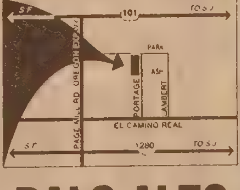
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- 101/102 Key Compatible Key Layouts
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20-6400 DPI • Tactile Click Keys
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Precision Performance in a 101 Keyboard for IBM PC/AT and PS/2 Compatible • Two Cable Channel • Soft Touch Keys • Includes PS/2 Adapter
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Keyboard Lock Function • Distinctive Built-in keyboard
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- Includes 6-Pin To 5-Pin Adapter
- 1-Year Warranty
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ELIMINATES MANY REPETITIVE MOTIONS
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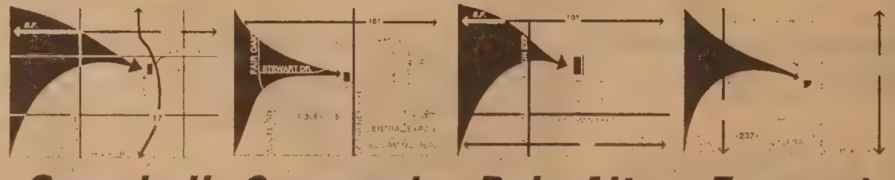

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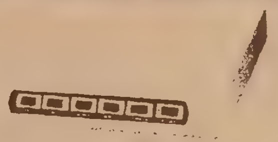
- Safety Lights turn red indicating power problems: Low Voltage light indicates power has fallen below 100 volts Outlet. Ground Lights indicate faulty wiring in the wall outlet Protection light indicates surge suppression is not working
- EM/RFI noise filtration • 15 AMP circuit breaker
- Eight foot power cord
- Rear mounted outlets organizes cords out of the way
- Surge Dissapation: 600 Joules (200 Joules each mode)

#1865749

$99.99

POWER CENTER
WITH SURGE PROTECTION



- 5 plug unit • 5 individually lighted controls
- Master ON/OFF Switch
- UL and CSA listed.

#1928017

$19.88

PROXIMA

POWER TOUCH SURGE PROTECTOR

Maximum energy dissipation 240 joules
Maximum clamping voltage 396 volts
4 outlets

MODEL PT10
#1621464

$49.95

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Maximum energy dissipation 240 joules
Maximum clamping voltage 396 volts
4 outlets, Full Surge Modem and Fax Protection
Lifetime Warranty
MODEL PT20
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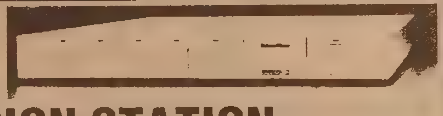

AVOID SYSTEM MELTDOWN!

SURGE SUPPRESSION STATION

- VL 1449 and IEEE 587 P180 A and B approved • 220 Joules dissipation
- Clamping response time less than 1 nanosecond
- Swivel base for convenient monitor adjustment
- Five outlets with masterswitch
- 8 ft. power cord

#156582

$89.99

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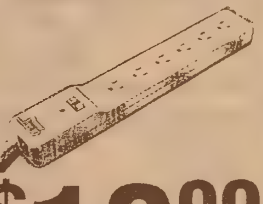


POWERTREE 10

Suppresses Surges up to 120 Joules
15 AMP Circuit Breaker
Platinum Color • Six outlets

#1423578

$16.99

KENSINGTON.

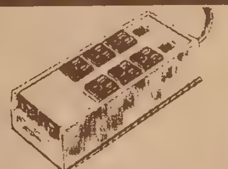
Avoid System Meltdown with:

POWERTREE 20

Surge Suppression Indication: LED and buzzer alarm
Rated Voltage: 120 Volts AC
Rated Current: 15 Amps • Clamping Voltage: 340V
Current Peak: 4500 Amps;
Energy Dissipation:120 Joules
Typical Response • Time:<1 nanosecond
Warranty: 1 Year #1423589

$19.99

KENSINGTON.



POWERTREE 50

- 6 Outlet Surge Protector - 420 Joules Dissipation
- Outlet spaced to accomodate even large conventer type plugs
- Modem & Fax Protection
- Noise Filter
- Audible alarm for unit failure

#1423604

$49.99

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EP6S METAL SURGE

MAXIMUM VOLTAGE ALLOWED THROUGH 400V
EP6S 210 JOULE
6 OUTLET SURGE PROTECTOR
EMI/RFI NOISE REJECTION
5 YEAR WARRANTY $250 CNCT EQP
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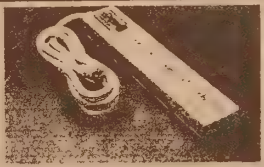

GET A WABER... IT'S THE BEST!

PowerMaster 6-Outlet Surge Protector

- Maximum voltage allowed through 400v maximum energy absorption. • 210 joules. • Clamping time: 1 nanosecond. • Noise reduction from outside sources.
- EMI/RFI lines protected. • H-N or maximum 3 line
- VL. 1449 Rating 400v

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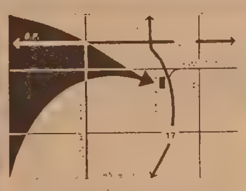

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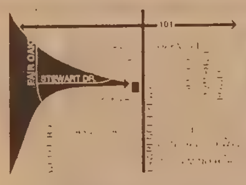

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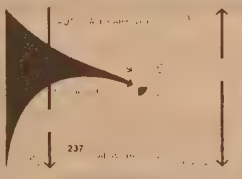

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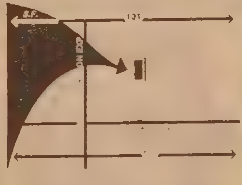

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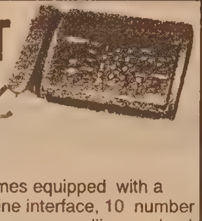
FRY'S HAS THE BEST SELECTION OF FAX MACHINES IN NORTHERN CALIFORNIA!



COMPACT FAX MACHINE

This unbelievable value comes equipped with a telephone answering machine interface, 10 number speed dialing, last number memory, polling, on-hook dialing, and remote operation (extension phone transfer to fax) all for only...

$198.99

MODEL FX-40
#1820524

SHARP

DESK/WALL MOUNTABLE FAX MACHINE

This Sharp fax machine compact design make it perfect for the home or office. With features that include 16 level halftones, contrast selection, memo pad, last number redial, hold, paper save, anti junk fax, call tracking report (up to 300 calls and fax transmissions/receptions), 20 number memory, and much more, all for just....

$239.95

MODEL NX-1
#1839559

SHARP

FAX

WITH DOCUMENT REDUCTION CAPABILITIES

Sharp's unique time-and paper-saving functions offers several compressions methods to minimize time and paper consumption. The effective size of outgoing documents can be reduced by 20% for faster transmission. And for incoming faxes, it can be set to ignore unprinted areas or reduce documents by 50%. Other features include 50 number memory, 10 page document feeder, 16-level halftone, and much more, all for only...

$248

MODEL UX-104
#1885664

PAPER CUTTER FAX MACHINE

WITH 10 PAGE FEEDER

This great little fax machine features an auto paper cutter which combined with the built-in decurl function makes document handling a snap. Other features include an answering machine interface and a 10 page document feeder.

$269

MODEL FX-1500
#1855414

AT&T

PERSONAL FAX

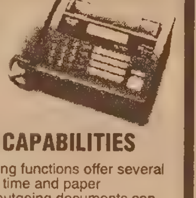
WITH AUTO PAPER CUTTER

Perfect for the home or office. This AT&T compact personal fax with auto paper cutter comes equipped with a 5 page document feeder, 12 one-touch dialing numbers and 30 auto dial numbers, on hook dialing, polling, resolution and contrast control, transmission terminal identification, delayed transmission polling and much more, now just...

$279

MODEL FAX-7840
#1850855

SHARP



FAX MACHINE

WITH PAPER CUTTER & DOCUMENT REDUCTION CAPABILITIES

Sharp's unique time and paper-saving functions offer several compressions methods to minimize time and paper consumption. The effective size of outgoing documents can be reduced by 20% for faster transmission. And for incoming faxes, it can be set to ignore unprinted areas or reduce documents by 50%. Other features include 50 number memory, 10 page document feeder 16-level halftone, and much more, all for only.....

$289

MODEL UX-174
#1885686

brother We're at your side

FAX MACHINE

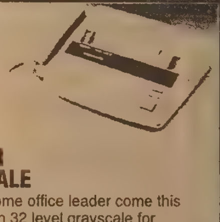
WITH PAPER CUTTER

Brother's breakthrough fax machine incorporates newly developed therma plus technology which uses fax paper that feels like plain paper and reduces print fading (lasts 3 times longer than thermal paper under normal filing conditions, and you can even use a highlighter!). Other features include, 15 page document feeder, 60 station memory, 16 level grey scale, activity report, polling and much more for only...

$299

MODEL FAX-620
#1896510

brother We're at your side



FAX MACHINE

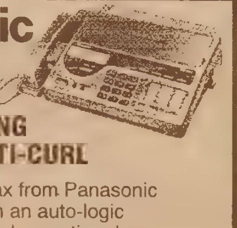
WITH PAPER CUTTER & 32 LEVEL GRAYSCALE

From Brother the high tech home office leader come this feature laden fax machine with 32 level grayscale for enhanced contrast reproduction, 60 station memory, 10 page auto document feeder, anti-curl mechanism, smoothing, multiple resolution transmission, 16 digit LCD display, activity report, Polling, next fax reservation, and much more. Now just...

$329

MODEL FAX-640
#1917437

Panasonic



FAX

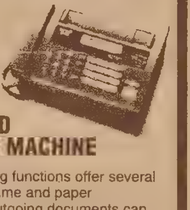
WITH ANSWERING MACHINE & ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and an anti-curl mechanism, as well as copier capabilities. It's the perfect secretary for your home or business!

$349

MODEL KX-F180
#1877490

SHARP



FAX MACHINE

WITH PAPER CUTTER AND ALL DIGITAL ANSWERING MACHINE

Sharp's unique time and paper-saving functions offer several compressions methods to minimize time and paper consumption. The effective size of outgoing documents can be reduced by 20% for faster transmission. And for incoming faxes, it can be set to ignore unprinted areas or reduce documents by 50%. Other features include 50 number memory, 10 page document feeder 16-level halftone, and much more, all for only...

$399

MODEL UX-254
#1842838

Panasonic

FAX MACHINE

WITH PAPER CUTTER AND ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and auto paper cutter, as well as copier capabilities. It's the perfect secretary for your home or business!

$399

MODEL KX-F280
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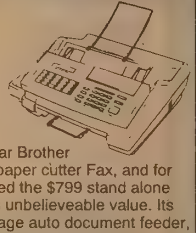
brother We're at your side



PLAIN PAPER FAX

Brother's done it again! Last year Brother broke the $400 price barrier in paper cutter Fax, and for an encore, Brother has destroyed the $799 stand alone plain paper Fax barrier with this unbelieveable value. Its 200 sheet paper cassette, 30 page auto document feeder, on-screen programming, "smoothing" enhanced image resolution, 48 digit LCD display, multiple resolution transmission, 32 level grayscale, 60 station memory, and Fax/Tel Switch makes this the best value you will find at only...

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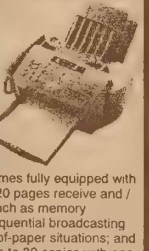
MODEL FAX-900
#1801817

SHARP



PLAIN PAPER FAX

WITH 512 KB MEMORY

Sharp's innovative plain paper fax machine comes fully equipped with 512KB (28 pages total, 8 pages receive only, 20 pages receive and / or send) memory provides various functions such as memory transmission for quick return of the original; sequential broadcasting up to 20 stations; substitute reception for out-of-paper situations; and multicopy, with sorting capability, for making up to 30 copies with one pass of the originals Other features include 15 page document feeder, 50 number memory, and much much more. All for just...

$698

MODEL UX-1200R
#1853168

HEWLETT PACKARD
Authorized Dealer

PLAIN PAPER FAX MACHINE

WITH 256 KBYTES OF MEMORY

This plain paper fax offers 256 Kbytes of memory, a 20 page document feeder, 32 gray scale levels, 100 page capacity with easy front reloading, 12 page memory, plus many more outstanding features for only...

$719

MODEL HP-FAX900
#1841819

Panasonic

PLAIN PAPER FAX MACHINE

WITH 20 PAGE MEMORY

The ultimate plain paper fax from Panasonic features a jumbo LCD display, 70 page paper cassette, adjustable letter/legal tray, 32 level halftones, polling, activity reporting, 20 page document feeder, broadcasting to 128 locations, fax transfer, enlargement and reduction copier functions, fax/tel switch, 28-station one-touch dialer, 100-station speed dialer, telephone directory with alpha-search, and much more! Now just.....

$898

MODEL KX-F3000
#1850626

HEWLETT PACKARD
Authorized Dealer

PLAIN PAPER FAX MACHINE

WITH 512 KBYTES OF UPGRADEABLE MEMORY

This plain paper fax offers 512 Kbytes of memory for 28 page out of paper reception, a 30 page document feeder, 64 gray scale levels, 100 page capacity with easy front reloading, plus many more outstanding features for only...

$899

MODEL HP-FAX950
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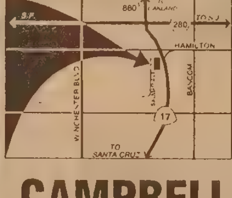

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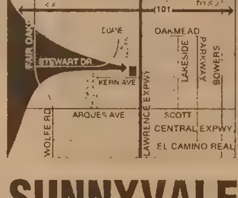

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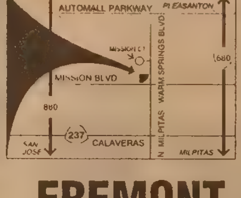

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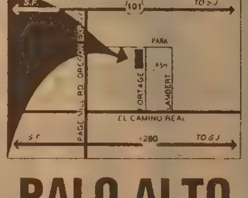

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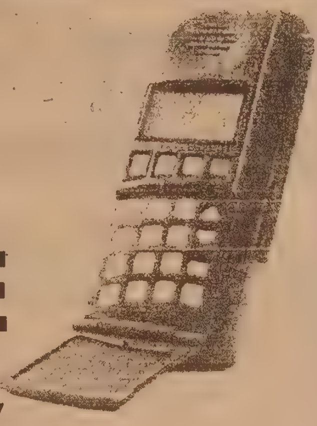

CELLULAR FLIP PHONE

WITH 100 NUMBER ALPHANUMERIC MEMORY

Everyone has flipped for flip phones, and this GE Pocketfone is one of the reasons why! With its 100 Number Alphanumeric Memory (names and numbers can be stored together and scanned alphabetically), Menu Scroll, Dual NAM, 8 Level Call Restrictions, Last Number Redial, Lighted Keypad, Auto Scratchpad, Mute, Low Battery Warning, Speed Dialing, Call Mailbox, 90 Minute Talk Time Battery, Overnight Charger, and much more! Refurbished to work like new at only...

Authorized Sales Representative

GTE Mobilnet

Get Mobilized℠

$99^99*

Model CT-400R**
#1906411

*After $25 Instant Service Activation Rebate.
Price w/o Activation $124⁹⁹

MOTOROLA

Authorized Sales Representative

GTE Mobilnet

Get Mobilized™

ALPHA MICRO-TAC CELLULAR PHONE

If it's small and lightweight you're looking for, this is the cellular phone for you! With its 101 alphanumeric memory, a desktop charger, and standard battery, this technologicaly advanced cellular phone can be yours for only...

$319^95*

*After $25 Instant Service Activation Rebate. Price w/o Activation $344⁹⁵

Model DPCAC Deluxe**
#1635988

MOTOROLA

Authorized Sales Representative

GTE Mobilnet

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MICRO TAC LITE CELLULAR PHONE

This popular pocket-sized cellular phone from Motorola combines convenience and high performance with features that include 101 alphanumeric memory, retractable antenna, dual NAM, automatic redial, super speed dialing, battery, overnight charger, carry case and more. Now just...

$439^95*

*After $25 Instant Service Activation Rebate. Price w/o Activation $464⁹⁵

Model Micro Tac Lite**
#1705832

CELLULAR BATTERIES	BATTERY ELIMINATOR	LEATHER CASES
FOR MOTOROLA MICROTAC #1918391 STARTING AT **$39⁹⁹**	**FOR MOTOROLA MICROTAC** #1918313 STARTING AT **$19⁹⁹**	**FOR MOTOROLA MICROTAC** #1818482 STARTING AT **$29⁹⁵**
FOR MOTOROLA 8000/9000 SERIES #1918416 STARTING AT **$39⁹⁹**	**FOR MOTOROLA 8000/9000 SERIES** #1918335 STARTING AT **$19⁹⁹**	**FOR MOTOROLA 8000/9000 SERIES** #1818471 STARTING AT **$29⁹⁵**
FOR General Electric CT 400R #1918438 STARTING AT **$39⁹⁹**	**FOR General Electric CT 400R** #1921782 STARTING AT **$19⁹⁹**	***THESE ARE JUST A FEW EXAMPLES OF THE CELLULAR SELECTION AND SAVINGS AT FRY'S***

MOTOROLA

MICRO TAC ULTRA LITE CELLULAR PHONE

WITH VIBRA CALL

Authorized Sales Representative

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Get Mobilized™

Motorola's lightweight champion of cellular phones tips the scales at only 5.9 ounces and contains a unique ring selector that includes a setting for vibrate, just like a pager! Other features include 101 alpha-numeric memory, memory scroll, recall, two batteries, rapid charger, carry case, and more for only ....

$599^95*

*After $25 Instant Service Activation Rebate. Price w/o Activation $624⁹⁵

Model Micro Tac Ultra Lite**
#1794986

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VISA AND MASTERCARD ACCEPTED

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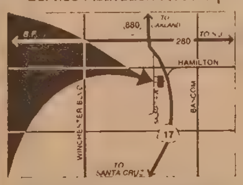
* *Service Activation Not Required. No Sales To Dealers Or Resellers. Limit One Per Family.



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TO S.J.
280
HAMILTON
WINCHESTER BLVD
BASCOM
17
TO SANTA CRUZ

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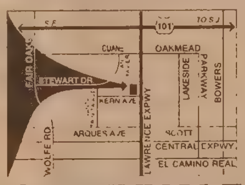

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STEWART DR.
OAKMEAD
KERN AVE
LAKESIDE
PARKWAY
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SCOTT
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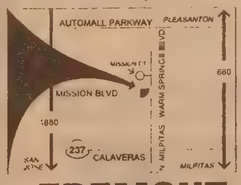

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YOUR BEST PANASONIC HOME OFFICE BUYS ARE ALWAYS AT FRY'S!

ANSWERING MACHINES

Panasonic

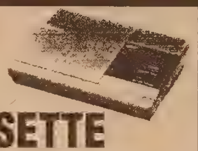
ANSWERING MACHINE

Answering System with Auto-Logic Operation, Tone Remote Control, Digital Display, Message Memo Recording and remote turn on, Auto-Logic Operation automatically rewinds, plays messages, stops at the last message and resets itself at the touch of one button.

$39.99

MODEL KX-T1000
#1498194

Panasonic



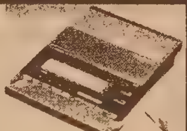
DUAL MICRO CASSETTE ANSWERING SYSTEM

Panasonic's new dual micro cassette answering system offers an LCD Call Counter, marker message, room monitor, auto disconnect, electronic auto disconnect, electronic volume control, audible message alert, and much more for only...

$69.95

MODEL KX-T2100
#1740208

Panasonic



ALL DIGITAL ANSWERING MACHINE
WITH VOICE TIME/DAY STAMP

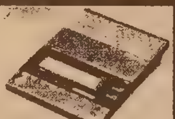
WHILE THEY LAST

Panasonic's versatile all digital answering machine comes equipped with 18 minutes of total recording capacityand voice promps for time, AM/PM, voice remote menu, number of messages, pre-recorded greeting messages, and time/day stamp on each message. Other features include LCD readout, quick playback, message alert, room monitoring, 2-way and memo recording, and much more! Now just...

$119.95

MODEL
KX-T8000
#1719873

Panasonic



ALL DIGITAL ANSWERING MACHINE
WITH 30 MINUTE CAPACITY & VOICE TIME/DAY STAMP

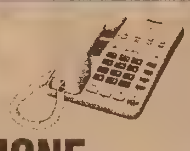
This Panasonic all digital answering machine comes equipped with 30 minutes of total recording capacity and voice promps for time, AM/PM, voice remote menu, number of messages, pre-recorded greeting messages, and time/day stamp on each message. Other features include LCD readout, quick playback, message alert, room monitoring, 2-way and memo recording, and much more! Now just...

$159.95

MODEL
KX-T8100
#1914607

BUSINESS PHONES

Panasonic



SPEAKERPHONE

For the office or home, this phone has all the features you need. It has a speaker phone, 28 station automatic dialer, automatic redial and much more.

$49.95

MODEL KX-T2315
#1530100

Panasonic

TWO LINE SPEAKERPHONE

A perfect compliment to your home or office, this two-line speakerphone comes equipped with 3-way conferencing, 20 number programmability, seperate ring switches for each line, and a local mode function. Now only...

$69.99

MODEL KX-T3120
#1510676

Panasonic

TWO LINE SPEAKERPHONE
WITH LCD DISPLAY

From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

$89.95

MODEL KX-T3175
#1745122

Panasonic

THREE LINE SPEAKERPHONE
WITH LCD DISPLAY

From Panasonic comes this fully featured 3-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 48-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

$169.95

MODEL KX-T3185
#1768039

10 CHANNEL CORDLESS PHONES

Panasonic

10 CHANNEL AUTOSCAN CORDLESS PHONE

Panasonic's newest cordless phone comes equipped with a retractable flexible rubber antenna, sound charger technology, which helps filter out back- ground noise resulting in enhanced sound quality, and 1-way paging between the base and handset. An excellent value at only...

MODEL KX-T3850
#1764839

$79.95

Panasonic

2-LINE 10 CHANNEL CORDLESS PHONE
WITH SPEAKERPHONE

The KX-T3980 is one of the most versital phones Panasonic has ever developed! When you combine the convenience of a cordless phone with the flexibility of a 2-line capability along with speakerphone, 3-way conference, 2-way page, and auto intercom, it all adds up to a value too good to pass up!

$179.95

MODEL
KX-T3980
#1671595

Panasonic

10 CHANNEL CORDLESS SPEAKERPHONE
WITH DUAL MICROCASSETTE

This top of the line cordless dual microcassette answering system with sound charger technology delivers sound so clear, you will hardly believe your ears! Some of the features included are: 2-way paging, intercom, auto security system, message alert, 2-way and memo recording just to name a few. Now only...

$199.95

MODEL
KX-T4400
#1735370

FAX MACHINES

Panasonic

FAX
WITH ANSWERING MACHINE & ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and an anti-curl mechanism, as well as copier capabilities. It's the perfect secretary for your home or business!

$349

MODEL KX-F180
#1877490

Panasonic

FAX MACHINE
WITH PAPER CUTTER AND ANTI-CURL

This Fax from Panasonic comes equipped with an auto-logic answering system and auto paper cutter, as well as copier capabilities, speakerphone, paper save, paper curl reduction technology, 100 number speed dialer and much more. Now just...

$399

MODEL KX-F280
#1886159

Panasonic

PLAIN PAPER FAX MACHINE
WITH 20 PAGE MEMORY

The ultimate plain paper fax from Panasonic features a jumbo LCD display, 70 page paper cassette, adjustable letter/legal tray, 32 level halftones, polling, activity reporting, 20 page document feeder, broadcasting to 128 locations, fax transfer, enlargement and reduction copier functions, fax/tel switch, 28-station one-touch dialer, 100-station speed dialer, telephone directory with alpha-search, and much more! Now just.....

$898

MODEL KX-F3000
#1850626

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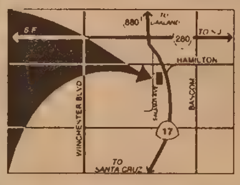

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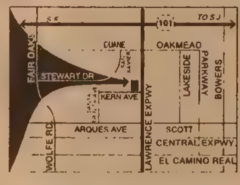

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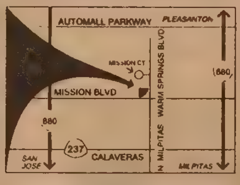

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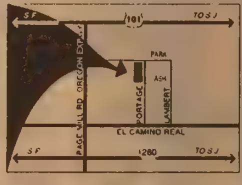

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THINK FRY'S FIRST
FOR HOME OFFICE SERVICE SELECTION AND SAVINGS

SPEAKERPHONES

SPEAKERPHONE
WITH 20 NUMBER MEMORY

The convenience of a hands free speakerphone allows you to do other tasks while carrying on a conversation on the phone. Features include 20 number memory, auto redial, mute, in-use indicator light, and more. An excellent addition to any home or office at only...

$19.99

#1915723

BELL Phones BY NORTHWESTERN BELL PHONES
A U S WEST COMPANY

SPEAKERPHONE
WITH LCD DISPLAY

This Northwestern Bell speakerphone comes loaded with features like an LCD which displays time & date, alarm & timer, and number called display, on-hook dialing, 30 number memory, busy redial, flash, pause, speaker volume control, and much more for only...

$39.95

MODEL ET 2500S
#1810185

AT&T

SPEAKERPHONE

With features like hands-free speakerphone, 32 number memory, hold, receiver and speaker-phone volume control, last number redial, flash, ringer control, programmable pause, mute, just to name a few, this AT&T speakerphone will be an excellent addition to any home or office at only...

$49.95

MODEL 725
#1671621

Panasonic

LCD READOUT SPEAKERPHONE

This outstanding value from Panasonic offers a 12-digit LCD readout for phone number, clock, call timer(minutes and seconds), and operating modes. Perfect for the home or office at only...

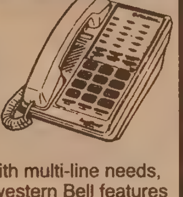
$69.95

MODEL KX-T2365
#163665

MULTI-LINE PHONES

BELL Phones BY NORTHWESTERN BELL PHONES
A U S WEST COMPANY

TWO LINE PHONE



Perfect for the home office with multi-line needs, this 2-line phone from Northwestern Bell features line-in-use LEDs, 3-way conferencing, 15 number memory, hold, flash, pause, and ringer controls. An excellent value at...

$39.99

MODEL
Easytouch 2202
#1890905

Panasonic

2-LINE SPEAKERPHONE
WITH LCD DISPLAY

From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

$89.95

MODEL KX-T3175
#1745122

GENERAL ELECTRIC
GE We bring good things to life

FOUR LINE SPEAKERPHONE

This deluxe four-line speakerphone is capable of handling up to four lines with a maximum of 16 stations. Its convenient 32 number one-touch telephone memory, along with all station page, intercom, call transfer, busy redial, flash and much more make this the perfect addition to any home or office at just......

$149.95

MODEL 2-9450
#1768637

AT&T

3-LINE SPEAKERPHONE

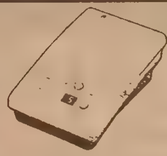
AT&T's multi-functional centrex compatible 3-line speakerphone comes equipped with page, intercom, 3-way conference, LCD display, 40 number memory, auto line selection, hold, do not disturb function, auto-redial, mute, programmable pause, call transfer, flash, seperate ringer controls, and more, all for only.....

$179.95

MODEL 843
#1853892

ALL DIGITAL ANSWERING MACHINES

AT&T



ALL DIGITAL ANSWERING MACHINE

This AT&T answering system utilizes tapeless digital technology to ensure consistent recording quality over the life of the system. The convenience of new message playback, outgoing message bypass, remote system turn on or off and remote message recording makes this an excellent value at only...

$69.95

MODEL 1710
#1853906

GENERAL ELECTRIC
GE We bring good things to life

ALL DIGITAL ANSWERING MACHINE
WITH THREE MAIL BOXES

With three mailboxes to choose from, members of the household can have messages stored for them in their own mailbox! The all digital capability eliminates the need for moving parts and allows for instant playback of incoming messages-no need to wait for a tape to rewind or fast forward! Other features include voice time/day stamp, two outgoing messages, digital counter, selective message erase and much more for only...

$89.95

MODEL 2-9876
#1839261

SONY.

ALL DIGITAL ANSWERING MACHINE

W/ VARIABLE SPEED MESSAGE PLAYBACK

Sony has taken digital technology to a new dimension with this beautifully-designed, all digital answering system. The variable-speed message playback controller allows you to speed up (to 1.6 times speed) or slow down (to 0.7 speed) playback of messages without changing pitch. In addition, you can skip, repeat or backspace messages. The multi-function LCD display functions as a digital message counter, clock, call timer, answer mode indicator, and back-up battery strength indicator, while the voice time/day stamp automatically records the time of the message receipt after each message. Other features include: Voice-guided operation, Pre-recorded greeting, Announce-only mode, Memory usage guage, Audible message alert, Remote on/off, Auto interrupt, Memo recording, 2-way conversation recording, and Adjustable ring delay. An invaluable addition to any home or office at only...

$129.95

MODEL
TAM-1000
#1803901

Panasonic

ALL DIGITAL 4 MAILBOX ANSWERING SYSTEM

W/SPEAKERPHONE & VOICE TIME/DAY STAMP

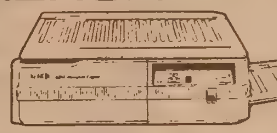
Panasonic's fully featured answering system comes equipped with 30 minute storage capacity, voice time/day stamp, speakerphone, voice menu, 4 personal mailboxes with security, lcd display, message scan, programmable alarm, message transfer, 2-way record, selective message delete, message skip/repeat, auto disconnect, auto redial, 10 number memory, and much more! An invaluable addition to any home or office at just...

$199.95

MODELKX-T2880
#1841989

COPIERS

XEROX



PERSONAL COPY MACHINE

The perfect choice for a home office, this great copier from Xerox has a 25 sheet stack paper feed and automatic exposure. As a bonus it comes with Xerox's exclusive three year warranty and total satisfaction guarantee.

MODEL 5210
#1782648

$399

SHARP

LETTER/ LEGAL COPIER
WITH STATIONARY PLATEN

This durable Sharp copier utilizes a stationary platen, a space-saving feature that eliminates the possibility of the copier bumping into objects while in operation. The variable zoom ratio setting adjusts between 70% and 124% in 1% increments giving you more copying flexibility and versatility. Other features include large capacity 250 sheet tray, continuous copy (up to max. 50), auto start, and letter/legal capacity. An excellent value at...

MODEL Z-85
#1903740

$699

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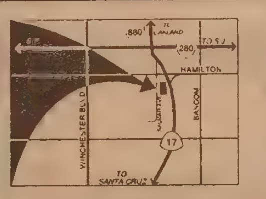

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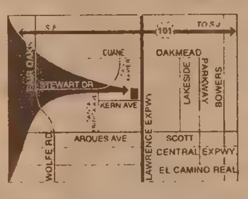

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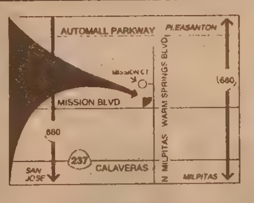

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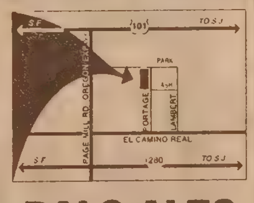

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PLUS WE STOCK: TEST ACCESSORIES, METER CASES, PROBES, CRYSTALS, OSCILLATORS, RESISTORS, CAPS, EPROMS, PALS, PROGRAMMERS, UV ERASERS, SOLDERING EQUIPMENT, TTL LOGIC, DISCRETES, ELECTRONIC KITS, DATA BOOKS, TECHNICAL BOOKS AND MUCH MORE...

Tektronix

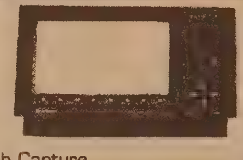
100MHz DIGITAL STORAGE OSCILLOSCOPE

With the introduction of the TDS 320, Tektronix redefines the low-cost digital oscilloscope. By sampling the signal at five times the analog bandwidth (500 mega samples per second on both channels simultaneously), you can be assured of true acquisitions, free from aliasing or other digital sampling effects TDS 320 is the only scope in its class that can reliably acquire high speed transient or single-shot events to its full bandwidth. The TDS 320 has Dot, Dot Accumulate, Vector, and Vector Accumulate display modes—another advantage over the competiton.

$2895

TDS 320
#1878446

HITACHI



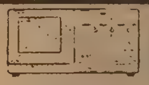
100MHz LOGIC ANALYZER

32 Data Channels • 5ns Glitch Capture
Multi-Level Triggering • 8K Memory/Channel
The VC-3120 Logic Analyzer provides 25MHz analysis on up to 32 channels. With Soft-Key menus & on-line instructions. This logic analyzer is easy-to-use yet powerful enough for advanced digital design & microprocessor system debugging

$1995

V-3120 #1746352.

Tektronix



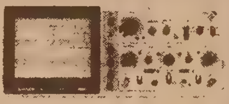
100MHz ANALOG 2 CHANNEL OSCILLOSCOPE

THE TAS 465 brings an advanced level of power and reliability to general purpose scopes. It brings leading edge innovation to low-cost analog scopes with comprehensive features. Comprehensive Video Triggering simplifies triggering on complex video waveforms. With line or field (odd, even, or both) composite video selections and positive or negative sync, you can cleanly trigger on any NTSC, PAL, or SECAM video signal. The scopes' dual time base lets you zoom in on any portion of a waveform for closer examination. Auto Setup instantly delivers meaningful waveforms. Pressing the AUTOSET button automatically adjusts the horizontal, vertical, and triggering controls so that a stable signal is displayed

$1995

TAS 465
#[illegible]

HITACHI



50Mhz OSCILLOSCOPE

With Single Time Base & High Resolution CRT. The usefullness of Hitachi scopes is extended to cover an array of new measurement applications.
2 channel • 6 inch screen
3 Year Warranty.

$995

V-522
#1746248

GoldStar

20MHz SCOPE W/BUILT-IN FUNCTION GENERATOR

1MHz Function Generator with three kinds of waveforms are available w/50ohm output and TTL Pulse. Two channels- single time base. Ideal for education applications. 1MHz fuction generator built-in this 20MHz, two channel scope. Sine, Square, Triangle and TTL Pulse output waveforms.

$469

OS-9020G
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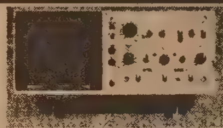

20MHz OSCILLOSCOPE

This lightweight, slim-line scope has become the standard of high performance. Hitachi scopes have earned acclaim from field-serving and maintenance personnel worldwide. 2 Channel, Single Time Base, 3 Year Warranty

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Model V-212
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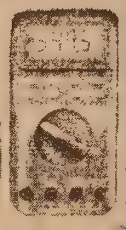

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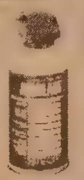

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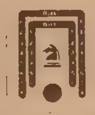

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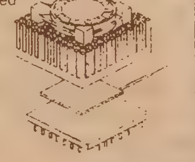

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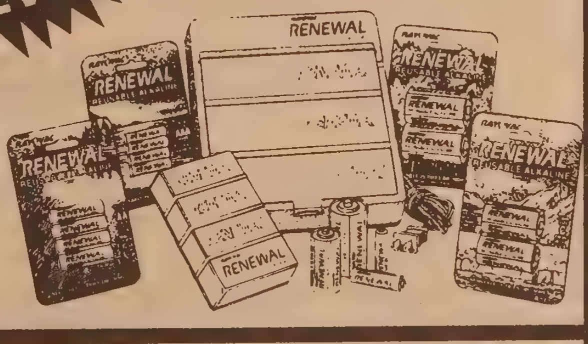

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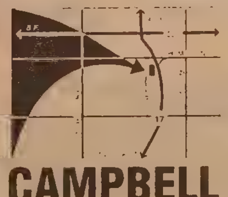

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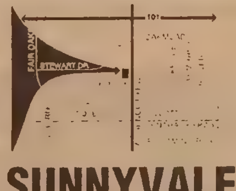

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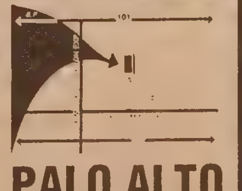

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Product Spotlight

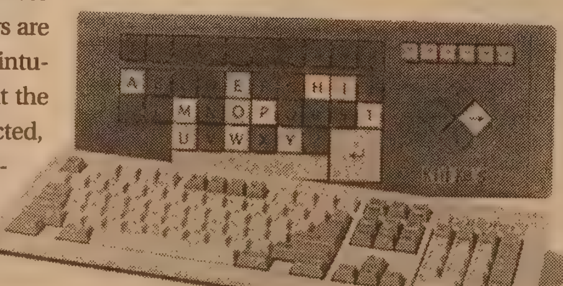
UPDATES

- **CE Software has lowered the price for registered users of QuicKeys to upgrade to v3.0.** It is now $39.95 to upgrade from any version. CE Software, 1801 Industrial Cir., P.O. Box 65580, West Des Moines, IA 50265. 1-800-523-7638.
- **Fractal Design announced a bundle consisting of Fractal Design Dabbler**, the new introductory natural-media paint application, **and Kurta Corp.'s new PenMouse tablet**. The package is available through December 31, 1994, for $249, a savings of $99. Fractal Design Corp., 335 Spreckels Dr., Aptos, CA 95003. (408)688-5300.
- **Genoa Systems has reduced the price** on its **VideoBlitz II** and **Phantom 32i** true color graphics accelerators. The VideoBlitz II is now $539 for the 2MB PCI version, and the Phantom 32i is now $299. Genoa Systems Corp., 75 E. Trimble Rd., San Jose, CA 95131. (408)432-9090.
- **Knowledge Revolution** announced an upgrade of **Working Model**, its mechanical simulation and analysis software for engineers, to **v2.0**. Available for Windows and Mac, it has a suggested retail price of $1495. Knowledge Revolution, Inc., 66 Bovet Rd., Suite 200, San Mateo, CA 94402. 1-800-766-6615.
- **MERGENT International** announced the release of several feature-rich **upgrades** to its product family to provide a more fully integrated product line, a **reduction in pricing**, and the use of recycled materials and soy inks in its packaging. MERGENT International, Inc., 70 Inwood Rd., Rocky Hill, CT 06067. (203)257-4223.
- **MicroFrontier** released **v3.0** of **Color It!**, the paint and image editing program for the Mac. It is available for $149.95. MicroFrontier, Inc., P.O. Box 71190, Des Moines, IA 50325. 1-800-388-8109.
- **MicroHelp** upgraded **Uninstaller**, its utility for removing Windows applications, directories, subdirectories, and auxiliary files, to **v2**. Upgrades from v1 are $29, otherwise the suggested retail price is $69.95. MicroHelp, Inc., 4359 Shallowford Industrial Pkwy., Marietta, GA 30066. (404)516-0899.
- **Objects, Inc.** released a new version of its object-oriented desktop programming system. **Layout 3.03** for DOS is being distributed free of charge to all registered users of Layout 3.02 or is available for $299.95. Objects, Inc., NorthWoods Business Park, 99 Rosewood Dr., Danvers, MA 01923. 1-800-424-6644.
- **ParcPlace** introduced **VisualWorks v2.0**, a major new release of its object-oriented client and server tool for building portable applications. It is priced at $2995 for Windows, Windows NT, Mac, and OS/2 and $4995 for UNIX-based systems. ParcPlace Systems, Inc., 999 E. Arques Ave., Sunnyvale, CA 94086-4593. (408)481-9090.
- **PrairieSoft** released **DiskTop v4.5**, an upgrade to the file management program previously produced by CE Software. It is available for $30 to registered DiskTop users. PrairieSoft, Inc., P.O. Box 65820, West Des Moines, IA 50265. (515)225-3720.
- **Specular International** shipped **LogoMotion v1.5**, an upgrade to its instant 3-D flying logo animator, which is now optimized for the PowerMac. Registered users of v1.0 can get v1.5 for $39, otherwise the price is $149. Specular International, 479 West St., Amherst, MA 01002. (413)253-3100.
- **VIEW Software** has upgraded **Long File Names for Windows** to **v2.0**. The new version supports its feature set with Word, Excel, PowerPoint, Access, Mail, Publisher, and Visual Basic and is available for $29.95. VIEW Software, Inc., 916 Commercial St., Palo Alto, CA 94303. 1-800-487-8439, (415)856-VIEW.
- **VREAM** released **VRCreator v2 for Windows**, the latest version of its virtual reality development system. The software is available for $495, and an unlimited distribution license costs $295. VREAM, Inc., 2568 N. Clark St., #250, Chicago, IL 60614. (312)477-0425.

New Products

PC Hardware

Kid Keys Keyboard



The Kid Keys keyboard is designed for children aged two to seven. The letter keys are arranged in alphabetical order and brightly colored, and all the keys are 1" square, almost four times bigger than standard keys. The arrangement of the keys is designed to help young users learn the alphabet and numbers, and to make the many educational software programs more accessible to them. In addition, the R key is red, B is blue, Y is yellow, and G is green to aid in learning colors, and all the vowel keys are the same color. The cursor-control keys are intuitively arranged in a diamond shape so that the up key points up, etc. The sturdily constructed, FCC-approved keyboard requires no additional hardware or software. ($125) Greystone Digital, P.O. Box 1888, Huntersville, NC. 1-800-249-KEYS.

PC Software

Buy-Out Plan v6

Buy-Out Plan is designed to help merger and acquisition professionals develop a feasibility study, produce a financing plan, and prepare a professionally written proposal for a business acquisition. It consists of two main components: an Analysis Section and a Report Writer Section. The Analysis Section walks the user through the evaluation and planning process by analyzing the historic performance of the target company and then addressing a variety of finance and deal-structure related issues, such as valuing and pricing the acquisition candidate, financing the purchase, projecting results, and measuring short- and long-term return on investment. The Report Writer assembles the information gathered in the Analysis Section into an easy-to-read narrative format that can be edited in any popular word processor. ($395 through December 31, 1994, $595 thereafter) MoneySoft, Inc., One East Camelback Rd., Suite 550, Phoenix, AZ 85012. (602)266-7710.

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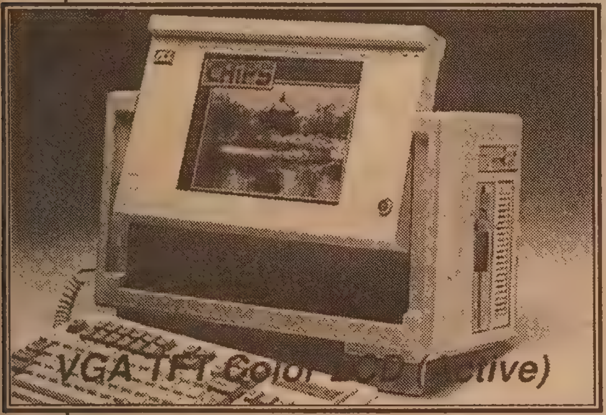

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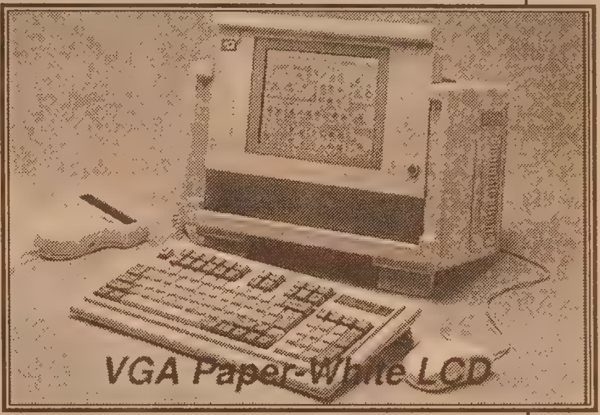
Build a Portable File Server. The 6 Expansion Slots in combination with capabilities of having up to 4 internal Storage Devices, makes our Portable the ultimate base for the Network Installer.

Technical Scientific Departments love our Portable which uses Full Length Expansion Boards & are frequently used as a Portable Measuring Instrument.



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•386DX-40/128K	$720
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BASIC SYSTEM INCLUDES:

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ORCHID KELVIN 64 PCI/VLB 1/2MB	145/185
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PORTABLE KEYBOARD	80

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LOGITECH MOUSEMAN (BUS)	48
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SOUND BLASTER PRO 16 MULTI-CD	145
EXTERNAL CD-ROM SCSI CASE/35W/P.S.	69
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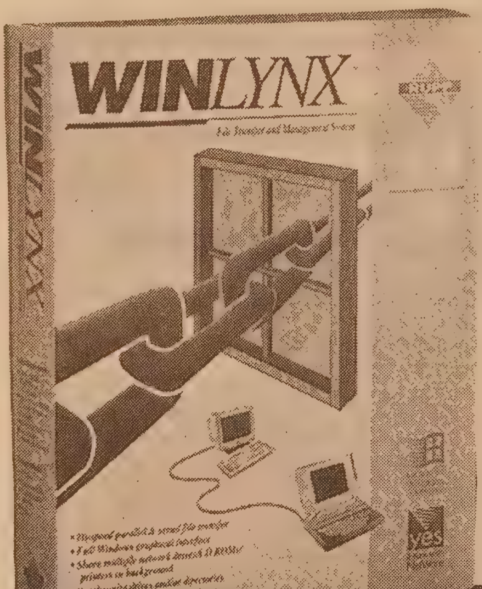
Rupp Technology WinLynx

WinLynx is a next generation PC-to-PC file transfer utility that allows users to move and manage files between connected personal computers while remaining in the Windows graphical user interface. It includes extensive drive and directory synchronization options, advanced resource sharing, and background file transfers at data transfer speeds boosted by Rupp's proprietary 18-wire parallel cable. WinLynx comes with WX Sync, a feature that permits complete synchronization of selected data so that two connected computers will end up with identical, time-stamped files or complete drives; and RUPPnet, a set of advanced resource sharing features that allows complete and easy access to any and all peripherals connected to linked computer systems. ($169.95) Rupp Technology Corp., 3228 E. Indian School Rd., Phoenix, AZ 85018. (602)224-9922.



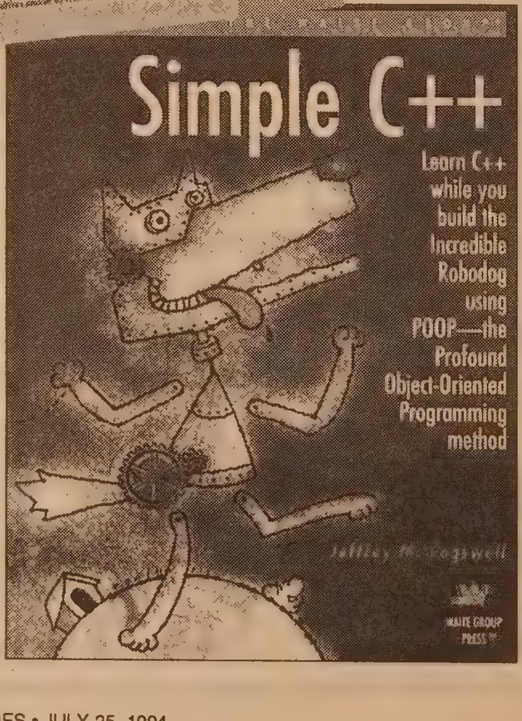
Books

The Non-Designer's Design Book

Robin Williams wrote her latest book, *The Non-Designer's Design Book*, "for all the people who are now in a position of designing pages, but who have no background or formal training in design"—such as the secretary laying out an office newsletter, the entrepreneur designing a new ad, the student wanting a better-looking term paper, or the professional creating a lasting impression with a new client. As a book of general design principles, it does not matter what computer you are using, or whether you are using a computer at all. The first half of the book covers design basics: proximity, alignment, repetition, and contrast. In the second half, the focus is on type, specifically the benefits and problems of combining multiple typefaces. ($14.95) Peachpit Press, 2414 Sixth St., Berkeley, CA 94710. 1-800-283-9444.

Simple C++

Simple C++, by Jeffrey M. Cogswell, is unlike other programming books—it is entertaining, accessible, and instructional. Using a sci-fi setting and the humorous icons of the Incredible Robot Dog, readers are eased into the world of C++ programming. Cogswell's concise chapters and everyday language guide readers through the fundamentals of POOP (Profound Object Oriented Programming). The Robot Dog's coworkers, Dr. Old and Linda Pavlov, for example, provide easy-to-understand definitions of key terms and help walk readers through procedural programming concepts while adding basic life functions, such as waking up, eating, playing, and sleeping, to the reader's creation. Friendly lab technicians show readers how to assign attributes and abilities to the Robot Dog's various body parts. ($16.95) Waite Group Press, 200 Tamal Plaza, Corte Madera, CA 94925. 1-800-368-9369.


Simple C++
Learn C++ while you build the Incredible Robodog using POOP—the Profound Object-Oriented Programming method
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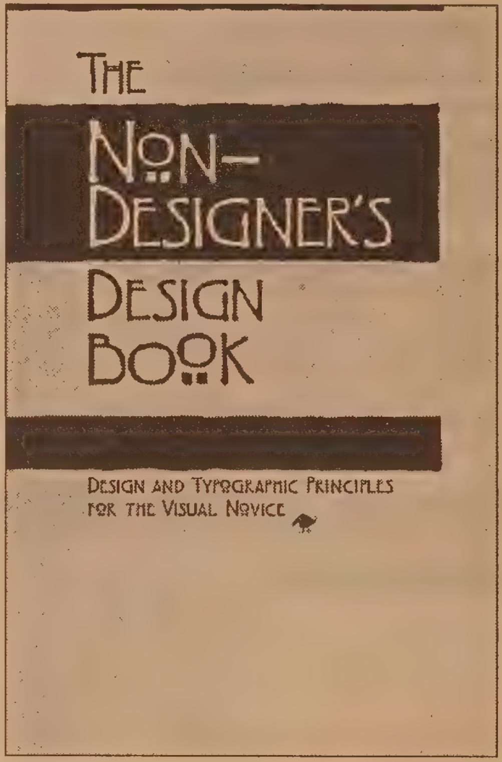
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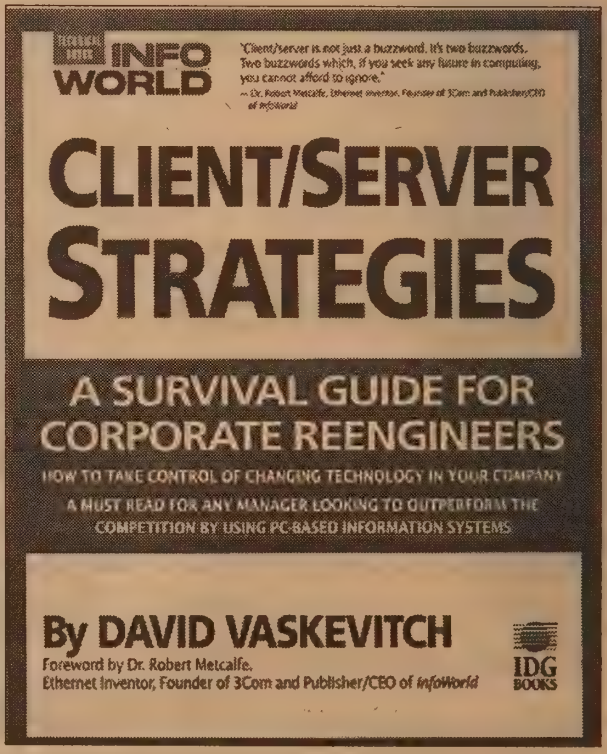
Client/Server Strategies

Client/Server Strategies: A Survival Guide for Corporate Reengineers, by David Vaskevitch, is written for both technical and nontechnical managers. It discusses "how computers will both force and permit people to change fundamental concepts about how they run their organizations and themselves. The changes are not necessarily caused by the technology itself, but this very technology will facilitate other fundamental trends such as personal empowerment, Business Process Reengineering, and self-managed teams." The book is divided into four sections: Crisis and Revolution; The Technology—Demystifying Computers and Networks; Designing and Building Client/Server Systems; and Conclusion—The Global Village. ($29.95) IDG Books Worldwide, Inc., 155 Bovet Rd., Suite 310, San Mateo, CA 94402.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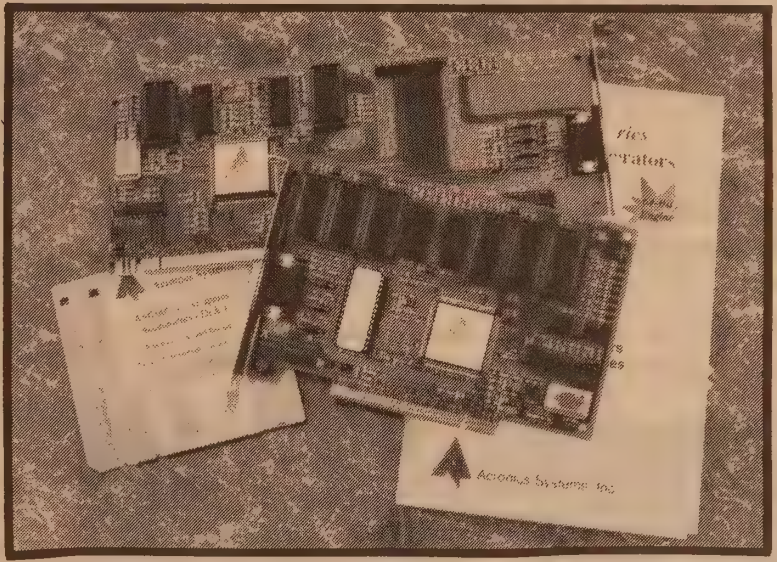

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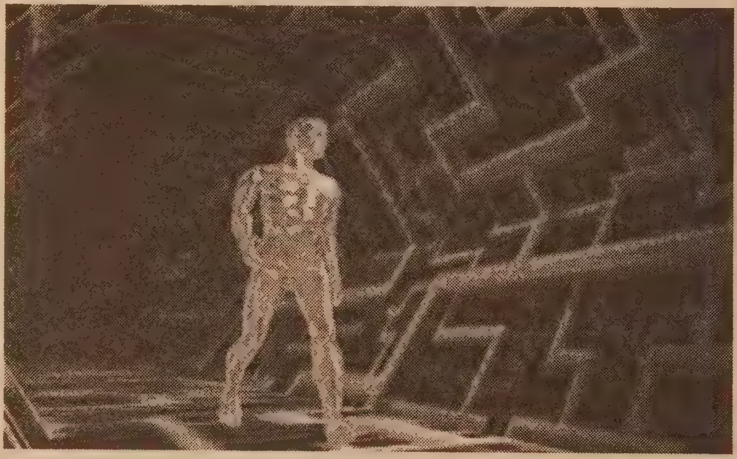
Reviews

Game Reviews

Lawnmower Man

List Price: $49.99
Published By: Sales Curve Interactive
For: IBM 386, 2MB RAM, CD-ROM @ 150k/s, VGA/SVGA, Sound Blaster
Reviewed By: Fred Haslam

If Dragons Lair had an evil twin brother, it would be named Lawnmower Man. This game is strictly timing and reactions set within poorly digitized animation sequences. Don't be fooled by the marvelous screen shots on the box or within the rules. All the screen shots come from the *movie!* On the back of the box it says "32 color game"; do not confuse this with 32-bit color.



The game starts where the movie *Lawnmower Man* ends. The doctor enters the VR realm in an attempt to defeat the now omnipotent Lawnmower Man. A woman's voice will tell you what to do as you zoom down corridors and dodge digitized traps.

The interface makes sense. The arrow keys are used for moving around, but like Dragons Lair, you are dead if you hit the wrong key. The graphics are high density with 256 colors, but only use thirty-two and look like monochrome. The animation is good, but that doesn't excuse the poor artwork. The music is average, closely synced to the animation. The only good point to the sound is the digitized voice telling you which key to press.

Lawnmower Man is a reflex game. You might waste an afternoon on it but it will soon be shelved, never to be seen again.

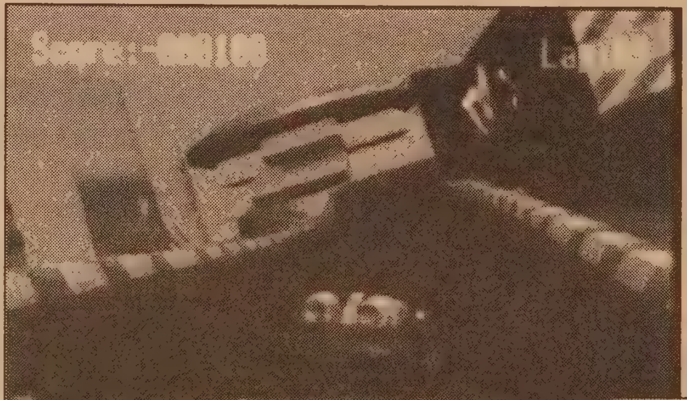
P.S. The company promises an upgrade to a 256-color version *if* you send them your CD. (Sales Curve Interactive, 330 Washington Blvd., Suite 700, Marina Del Rey, CA 90292-9859. 310/577-1515)

Megarace

List Price: $49.99
Produced By: Cryo Interface
Published By: The Software Toolworks, Inc.
For: IBM 386, MS-DOS 5.0, 2MB RAM, MCGA/VGA, mouse required, Sound Blaster/Adlib/Pro-Audium, CD-ROM @ 150k/s
Reviewed By: Fred Haslam

Megarace is fifteen minutes of game set within hours of eye-blasting graphics. The game itself is extremely simple—move left, move right, shoot. The backdrops are gorgeous, three-dimensional, animated fantasy sequences. The creators put a lot of time and energy into making this game beautiful.

This race game is set in the future. You are operating a race car within a "Virtual Reality" game show. A smarmy host named Lance Boil guides you from race to race, describing both settings and opponents. The settings are amazing. One track circles through an underwater city, another loop-de-loops on a low-gravity asteroid, and yet a third claims to be set inside a giant whale.



The graphics can only be described as incredible. The animation utilizes CD technology to the fullest. The music is movie quality. Both music and sound are closely sequenced with the graphics. The interface is almost intuitive, you will need to examine the help cards to figure out which keys to use.

As a racing game, Megarace could be better called Microrace. Play this game with a friend. That way, your friend can operate the controls while you bask in the graphics. (The Software Toolworks, Inc., 60 Leveroni Ct., Novato, CA 94949. 415/883-5157)

CD-ROM Reviews

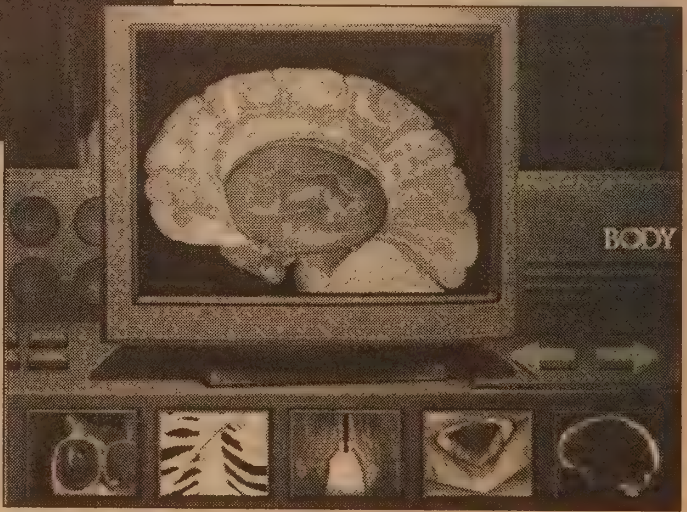
3-D Body Adventure

Published By: Knowledge Adventure, Inc.
List Price: $69.95
Reviewed By: Mark Will

3-D Body Aventure lets you explore the human body in a completely new and exciting way. It includes 3-D "flyby" movies that journey into the heart, the spine, the ear, the skeleton, and many other parts of the body. Also featured are fifteen movies in stereo 3-D (or 2-D) and two games (Body Recall and the Emergency Room game). The program comes with two pairs of 3-D glasses and a 32-page *User Guide* that offers suggestions on how children and parents might use the product. A mouse and sound card are suggested (but not required), and while it is a DOS package, it will run under Windows.

The main menu is easy to understand and most of the body imaging options are explained with sound when you click on

Continued on page 210



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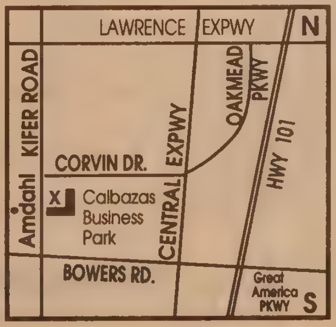

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DeskPorte Fast ES 28.8 Fax/Modem	299
DeskPorte Fast EP 28.8 Fax/Modem	399
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ENET 4 ports w/ modems/ w/o modems	5,647/4,127
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MICROTEST Ethernet LANModem	1,439
NOVELL NetWare Connect 2/8/32 pts	415/1,583/4,077
NetWare Connect 2-port w/Modems	987
NetWare Connect 8-port w/Modem and Serial I/O	3,811
SHIVA Net Modem/E 9600 BNC	1,567
Lanrover 4E/8E ports w/o modems	2,346/3,145

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CASTELLE Jetpress XIO BNC/10Base-T	381
Jetpress MIO for HP4/MIO PLUS	349/451
LANPress 10BT (1 PAR)	313
LANPress THIN/10BT (1PAR/1SER)	362
LANPress THICK/10BT (2 PAR/2SER)	512
EAGLE NPE400 1 LPT, BNC & 10BT	350
HEWLETT PACKARD JetDirect 10BT	330
JetDirect Combo BNC/10BT	400
JetDirect Token Ring	562
INTEL Netport EL for Ethernet	427
Netport EL for Token Ring	588
NetportExpress XL for Ethernet/Token Ring	475/660
MILAN Fastport 3000 1P/1S, BNC/10BT	459
Fastport 3100	710
XIRCOM Print Server 1 LPT, BNC/10BT	300
Performance Series 1 LPT, COMBO	432
Token Ring Print Server	580

Network Fax Solutions

CASTELLE FaxPress 1000, 10BT/BNC	1,576
FaxPress 2000 2-Line/4-Line	2,693/3,493
CHEYENNE FaxServe NLM 5/10/25	259/331/465
FaxServe NLM 50/100/250	599/800/1,135
FaxServe NLM 500/Unlimited	2,005/3,207
INTEL Satisfaxtion Modem 200/400	244/315
Net Satisfaxtion for 8 fax boards (20 users)	649
Net Satisfaxtion (1000 users)	1,040
DELRINA Winfax Pro for Networks (Server)	125
10/25/100 Users	678/1,492/2,836
Starter Kit (1 Server, 2 nodes)	270

Network CD-ROM

MERIDIAN CD-Net for DOS v4.31 (10 Users)	467
CD-Net for DOS v4.6 (10 Users/WAN)	648
CD-Net for NetWare (NLM-10 Users)	467
CD-Net for NetWare 100/250 Users	938/1,445
MICRO DESIGN SCSI Express for NetWare, MDI	558
SCSI Express for NW3.X, Non-MDI(20 Users)	910
SCSI Express for NW3.X, Non-MDI(250 Users)	1,332
CD-Rom LaserBank 600CD Ext. Sin./Dual	558/1,117
MICROTEST Discport Ethernet/Token Ring	599/799
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MT350 Value Kit	1,918
Penta Scanner	3,110
Fiber Solution Kit	1,366

Novell Software

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Lan Workplace for Mac Single/10 Users	289/1,437
Lan WorkGroup-5/10/20 Users	1,125/1,866/2,613
NetWare for Mac v3.12 200 Users/v4.0	685/851
Multiprotocol Router/Router Plus	720/1,032
NetWare NFS Single/5-pk	3,374/10,537
NetWare NFS Starter Kit	1,065
NetWare NFS Gateway 5/10 User	1,069/1,797
Global MHS v2.0 20 Users	358
Global MHS v2.0 50/100 Users	648/1,064
MHS v1.5 Network Edition 10 Users	140
MHS v1.5 Network 50/100 Users	504/733
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MHS Multi-Network 50/100 Users	504/733
Personal NetWare Single/5-Users	89/290
DOS 7 w/Personal NetWare	89

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Network Utilities

BRIGHTWORKS Utilities for NetWare	359
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Norton Admin. 25/50/100 Users	1,068/2,028/3,680

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LANtastic 6.0 Software 10/25 Users	637/1,272
LANtastic 6.0 Software 50/100 Users	2,118/3,460
LANtastic Managament Serv./Advan	144/578
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Noderunner/SI Combo	154
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Lantastic for TCP/IP Single/5 Pk	220/883
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CoreStream 50/100 Users	2,754/4,026
MICROSOFT Windows for Workgroup V3.11	159
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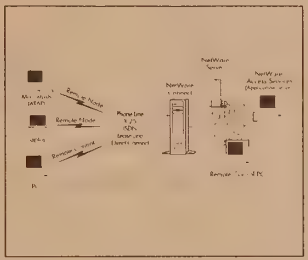

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8	$4,607
32	$5,614

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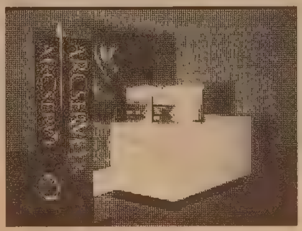

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Raidion EISA Host Adapter Kit	$381
Raidion ISA Host Adapter Kit	$326

Call for pricing on other configurations

Continued from page 206

that part of the main menu. One of the imaging options allows you to rotate the torso, stop, click on an organ, and then rotate that organ in a separate window and listen to a text window read aloud as it is scrolled. With another option you can travel through all the anatomical layers by moving your mouse up and down on your mouse pad.

3-D Body Adventure is suggested for children ages six and up. For ages six to eight there is the Body Recall Concentration-style game that teaches children to recognize and name parts of the body. For ages eight to twelve there is the multilayer visible body model and the Emergency Room simulation game. For ages thirteen and up there is a comprehensive electronic reference covering a wide range of topics including anatomy, development (from conception to adulthood), and medicine. The reference was written by a knowledgeable physician in easy-to-understand language.

This title features some seemingly small but important improvements that show that Knowledge Adventure is concerned about quality and consistency in its products. For instance, it now has talking, scrollable, text windows. This is great for younger viewers who are not yet able to read but can certainly listen and ask questions. Also, the movies can be played on the full screen in 3-D or 2-D. This shows concern for viewers who may not like glasses and is useful in case there aren't enough glasses to go around. Look for Knowledge Adventure to rerelease some of its older titles to make them consistent with newer releases.

Knowledge Adventure is not merely marketing its products for home use; it is also working with schools. Most of their titles have (or will have) teacher workbooks that make suggestions on how to use the software in a classroom environment. (Knowledge Adventure, 4502 Dyer St., La Crescenta, CA 91214. 818/542-4200)

Myst

Published By: Brøderbund
List Price: $60
For: Windows 3.1 or Macintosh 7.0.1
Reviewed By: Woody Liswood

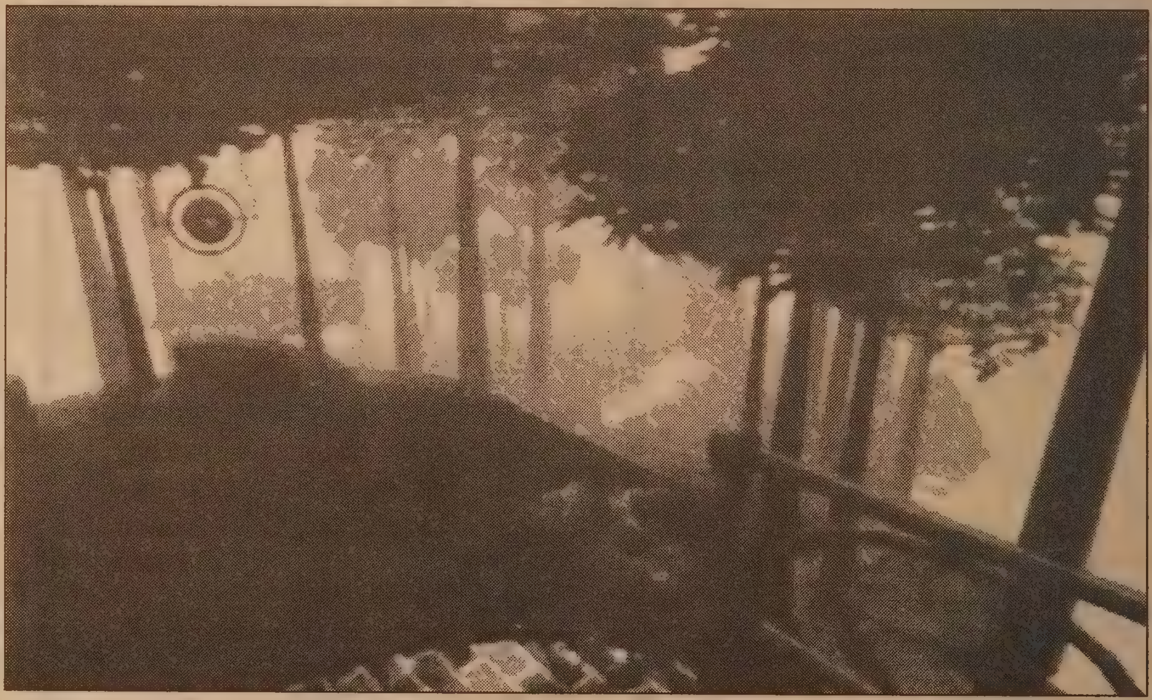
If you like adventure puzzle games, Myst looks like the current "best of breed." The graphics are wonderful. The sound is in sync with what you are looking at, and the puzzle is actually somewhat related to story and plot. In the CD-ROM environment, that means there are lots of graphics and sound.

Like Labyrinth of Time, you do spend some time running back and forth traveling over the same path. But unlike Labyrinth, Myst is not as boring, and the puzzle helps you along in retracing your steps.

The metaphor here is a multimedia book. It talks, but is mostly garbled at the start. As you fix the book, the message becomes clearer.

The accompanying documentation is minimal, letting you discover everything for yourself. You do, however, get a large, empty notebook to keep notes. Believe me, you'll need it. For instance, you will find multiples of numbers in various places which you will need to use in other places. As in life, things change, and those changes offer special meanings after you have looked around a bit (that's a hint).

As already mentioned, the graphics are some of the best I've seen for this type of game. This means you will need to study the screens carefully, since there are many items of significance waiting for you to notice. For example, if you mess up at one spot, later on you will need to find a ladder to fix a circuit breaker. I had difficulty discovering the ladder.



I have one main complaint. It is in saving and restoring particular games. Every other game I've played let me return to the exact same spot after saving the game. Myst puts you back in a particular spot each time and you have to catch up with where you were. I found this annoying and do not see why Brøderbund does not follow gaming procedure (if any such exists) for Myst. (Brøderbund, P.O. Box 6125, Novato, CA 94948-6125. 1-800-521-6263)

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486DX-50 (2 Local Bus)	256K	489	654
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ISA 486DX2-66 (AIR) (3 Slots Local Bus)	256K	469	634
486DX-50 (AIR) (3 Slots Local Bus)	256K	479	644
486DX-33 (AIR) (3 Slots Local Bus)	256K	368	533

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SCSI DTC 3290 AS (EISA)	380
SCSI DTC 3280K	105
SCSI Adaptec 1542C	168
DC200N ISA 512K On Board (Promise)	110
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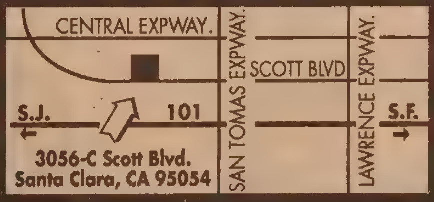

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Product Spotlight

Macintosh Software Review

Disc-To-Disc

Published By: Optical Media International
List Price: $199
Reviewed By: Matthew Leeds

CD-Audio is 16-bit stereo. It sounds great. Capturing that sound on your Macintosh and keeping the quality of the sound is not so easy. Aside from the AV Macs, you usually need to add an expensive sound capture card to capture 16-bit audio. Some Macs can't accept sound cards at all. Disc-To-Disc (DTD) can capture that sound with just a supported CD-ROM drive on any Mac that has a SCSI port.

DTD can capture sound at 11, 22, or 44.1KHz sample rates at either 8 or 16 bits. It supports AIFF/AIFC, SND, QuickTime, Sound Designer II, and Windows WAV file formats. You can capture in stereo, just the right or left channel, or mix the two channels down to one. Captures can be done in a batch mode and sections of a single track can be captured, with a waveform display that allows exact placement of the in and out capture points. MACE audio compression (3:1 or 6:1) is supported. It's important to note that not all Macs can play audio files from a hard drive and not all can play back at higher sample sizes and rates. A Mac LC is about the minimum that can handle a 44.1KHz 16-bit file.

This is a very slick product with a host of features that make it very easy to use. The interface is well thought out and the manual, while well done, can be mostly dispensed with. A laminated quick reference card is included that contains the information you'll need. The software is shipped on a CD with a nice set of sample audio tracks to start digitizing with. (Optical Media International, Inc., 180 Knowles Dr., Los Gatos, CA 95032)

Continued on page 313

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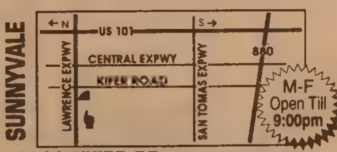

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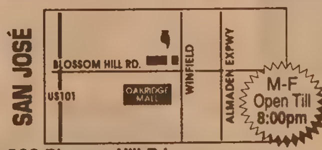

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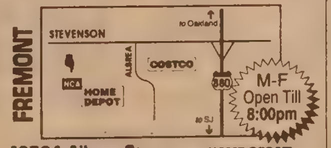

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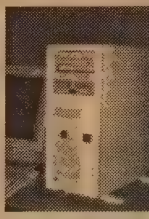

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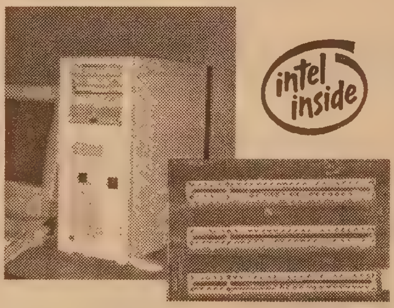

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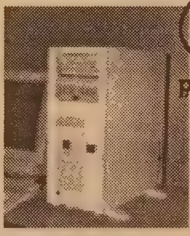

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VLB IDE Floppy Controller
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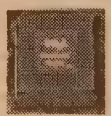

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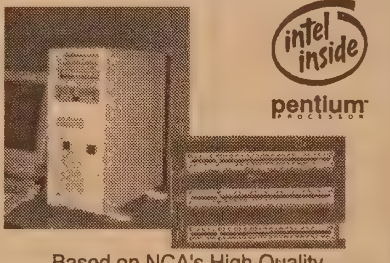

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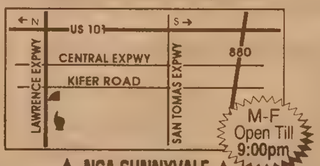

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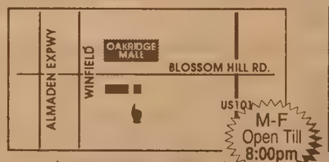

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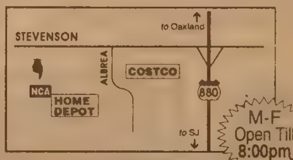

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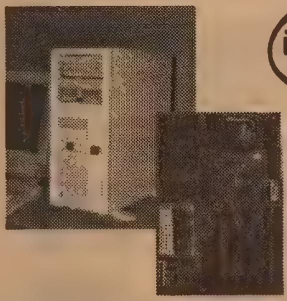

intel inside

486DX/2-66MHZ /VLB TOWER SYSTEM

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- Intel DX2/66 CPU
- 1 ISA 8-Bit/2 VESA Local Bus Slots
- 256K Cache exp. to 512K
- 0MB exp. to 64MB DRAM
- Award BIOS
- SIS Chip Set
- ZIF Socket
- Uses 4X30 Pin SIMMS or 2X72 Pin SIMMS
- Green PC Energy Star Compliant
- Teac 1.44M or 1.2M Floppy Drives
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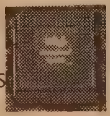

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intel inside

486DX/2-66MHZ /PCI & VLB TOWER SYSTEM

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- Intel DX2/66MHz CPU
- 3 PCI Slots
- 4 ISA 16-Bit / 1 ISA 8-Bit
- 2 VESA Local Bus Slots
- 256K Cache
- 0MB exp. to 128MB DRAM
- AMI BIOS
- ALI Chip Set
- ZIF Socket
- Uses 72 Pin SIMMS
- Green PC Energy Star Compliant
- Teac 1.44M or 1.2M Floppy Drives
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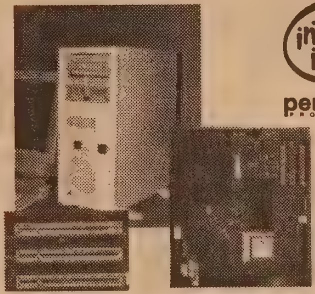

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- 1 IDE Interface
- 256K Cache
- 0MB exp. to 192MB DRAM
- AMI BIOS
- Intel Mercury Chip Set
- ZIF Socket
- Uses 72 Pin SIMMS
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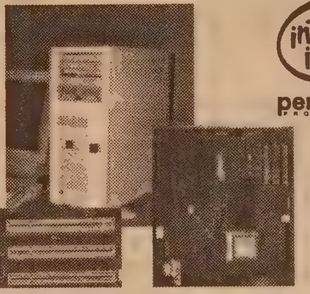

intel inside pentium PROCESSOR

PENTIUM 90MHZ /PCI & VLB TOWER SYSTEM

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- Intel Pentium 90MHz CPU
- 3 PCI Bus Master Slots
- 5 ISA 16-Bit Slots
- 2 VESA Local Bus Slots
- 256K Cache exp. 1MB
- 0MB exp. to 128MB DRAM
- AMI BIOS
- Opti Chip Set
- ZIF Socket
- Uses 72 Pin SIMMS
- Green PC Energy Star Compliant
- Teac 1.44M or 1.2M Floppy Drives
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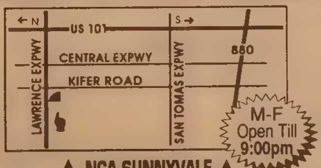

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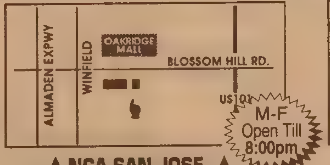

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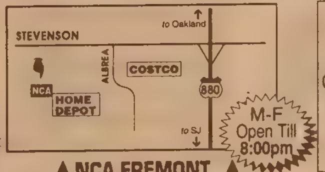

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HARD DRIVES

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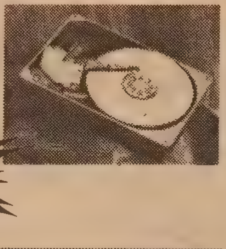

Lowest* Price Guaranteed

IDE

170MBIDE..............$189
7171A, 14ms, 1Yr. Warr.

245MBIDE..............$204
7245A, 14ms, 1Yr. Warr.

345MBIDE......$219
7345A, 14ms, 2 Yr. Warr.

405MBIDE..........$239
7405A, 14ms, 2 Yr. Warr.

540MBIDE..........$339
MXT-7540A, 8.5ms, 256K Cache, 2 Yr.Warr.

546MBIDE......$299
MXT-7546A, 12ms, 256K Cache, 2 Yr. Warr.

SCSI

External SCSI Drives Add $110

290MBSCSI....................$269
7290S, 14ms, 2 Year Warranty External $379

345MBSCSI....................$289
7345S, 14ms, 64K Cache, 2 Yr. Warr. External $399

540MBSCSI......$429
MXT-540S, 8.5ms, 256K Cache, 2 Year Warr. External $539

1.2GBSCSI $1195
MXT-1240S, 8.5ms, 3.5" HH, 256K Cache, 2 Yr. Warr. External $1315

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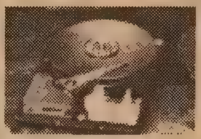

250MB IDE $219
13MS. MODEL#WD2250, 2Yr. Warr.

340MB IDE $229
12MS. MODEL#WD2340, 3Yr. Warr.

420MB IDE $249
13MS. MODEL#WD2420, 3Yr. Warr.

540MB IDE $329
12MS. MODEL#WD2540, 3Yr. Warr.

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High End, High Capacity

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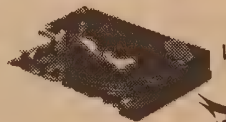
1.6GB SCSI-II

- DSP3160S
- 5400RPM
- 9.5ms
- 3.5" Drive



While Supplies Last.

$899

External 3.5GB $999

Fast SCSI-II

CAPACITY	M/N	SIZE	RPM	SPEED	INTERNAL	EXTERNAL
1.0GB	3107L	3.5"X1"	5400	9ms	$799	$929
2.1GB	**3210S**	**3.5"**	**5400**	**9.5ms**	**$1349**	**$1459**
3.5GB	5350S	FH	5400	11.5ms	$1999	$2199
4.0GB	5400S	FH	5400	11ms	$2699	$3899

CONNER®

IDE

210MB IDE............$168
14ms, CFA210

340MB IDE............$215
13ms, CFA340A

420MB IDE............$235
<12ms, CFS420A LOW PROFILE 3.5" X1"

540MB IDE............$299
<12ms, CFA540A LOW PROFILE 3.5" X1"

810MB IDE............$529
<12ms, CFA810A LOW PROFILE 3.5" X1"

1.08GB IDE...........$589
<9.5 ms, CFA1080A

SCSI

	INTERNAL	EXTERNAL
340MB SCSI CP30340S, 256K,3.5"X1"	$299	$419
540MB SCSI CP30540S, 3.5"X1", 256K	$429	$539
1.0GB SCSI CFP1060S, 256K, <10MS, 3.5"X1"	$594	$699

IBM®

1.0GB FAST SCSI-II
LOW PROFILE 3.5"X1"

- 750,000 Hrs. MTBF
- 8.6ms Access Time
- 5400 RPM
- 512K Cache
- 5Yr. Warr.

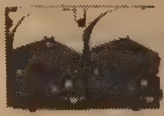
INTERNAL **$699**

External $819

2.0GB FAST SCSI-II, 3.5", 8.6MS.......$1299

4GB Fast SCSI-II

5.25" FORMAT: CONTAINS TWO 3.5" HDAS
ADDRESSABLE AS ONE LUN



- Data Stripping Across Two Actuators
- 1MB Multi-Segmented, Dual Port Data Buffer
- <10ms Read Access Time
- 5400RPM
- Up to 20MB/Sec Transfer Rate (sync)
- 375,000 hous MTBF
- 5Yr. Warr.

External $2799

$2599

364MB IDE $239
12ms, IBM364AT

527MB IDE $369
12ms, IBM527AT

728MB IDE..................$499
12ms, IBM728AT

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For MAC, SUN, NeXT, and IBM Compatibles

- High Quality Case
- 2 Centronics Output
- Noise-Free Fan
- External SCSI ID Switch
- External SCSI Cable (50C-50C or 50C-25C)
- Power Cable & Hardware
- Fully Tested & Approved
- Universal Power Supply 110/220V

Quality

See page 7 for a complete list of
External Hard Drives, CD-ROM Drives, Tape Backup Drive...

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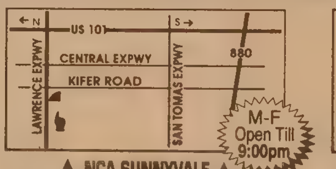

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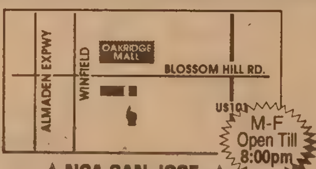

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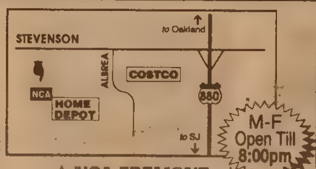

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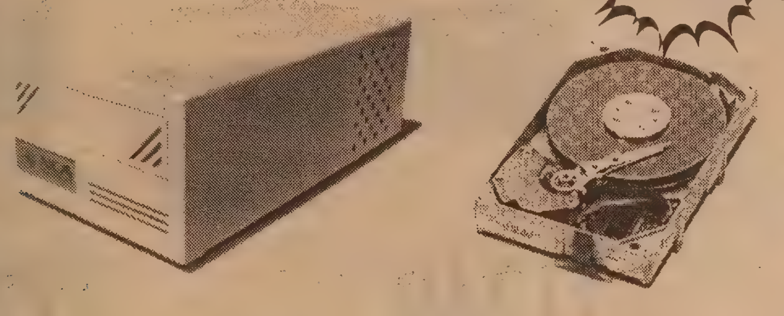

1.08GB FAST SCSI-III 3.5"X1"

1080S, 1.08GB Fast SCSI-III 3.5"X1"

NEW EMPIRE SERIES

$659

EXTERNAL $769

BRAND NEW WITH A TWO YEAR FACTORY WARRANTY · FIVE YEARS ON PD SERIES ONE YEAR ON 2.5" DRIVES

IDE

CAPACITY	M/N		SPEED	SIZE	PRICE
127MB	GLS127AT	FOR NOTEBOOKS	17ms	2.5"X17mm	........$249
170MB	GLS170AT		17ms	2.5"X17mm	........$279
256MB	GLS256AT		17ms	2.5"X19mm	........$339
170MB	ELS170A	32K	17ms	3.5X1"	178
210MB	LPS210A	32K	17ms	3.5"X1"	.............$179
270MB	**LPS270A**	**128K**	**12ms**	**3.5X1"**	**.............$229**
340MB	**LPS340A**	**128K**	**Fast**	**3.5X1"**	**.............$249**
540MB	**LPS540AT**	**128K**	**12ms**	**3.5X1"**	**.............$329**

SCSI

CAPACITY	M/N		SPEED	SIZE	PRICE
160MB	GRS160S	FOR MAC POWERBOOKS	17ms	2.5" X17mm	........$259
256MB	GLS256S		17ms	2.5"X19mm	........$349

CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
170MB	ELS170S	32K	17ms	3.5X1"	$189	$299
240MB	LPS240S	128K	12ms	3.5X1"	$259	$369
270MB	LPS270S	128K	12ms	3.5X1"	$279	$389
340MB	LPS340S	128K	FAST	3.5X1"	$299	$409
540MB	LPS540S	128K	12ms	3.5"X1"	$379	$489
540MB	EMPIRE	512K	9.5MS	3.5"X1"	$499	$629
1.0GB	PD1080S	512K	9.5ms	3.5"X1"	$659	$769
1.4GB	1400S	512K	8.9ms	3.5"X1"	$899	$999
2.1GB	**EMPIRE**	**512K**	**8.9ms**	**3.5"**	**$1199**	**$1299**

▶ FACTORY NEW WITH FULL FACTORY-WARRANTY

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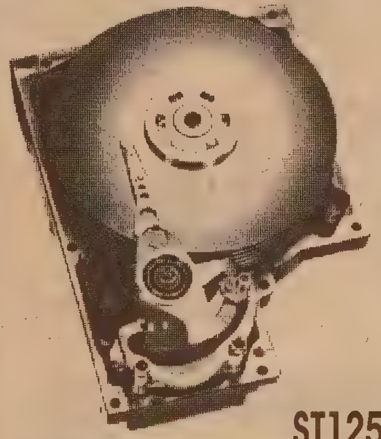
BARRACUDA SERIES



BARRACUDA I / 1.6GB

ST11950N

- ▶ 3.5", 8ms
- ▶ 7200RPM
- ▶ Fast SCSI-II
- ▶ 500,000MTBF

INTERNAL $1249

EXTERNAL $1359

BARRACUDA II / 2.1GB

ST12550N

- ▶ 3.5", 8ms
- ▶ 7200RPM
- ▶ Fast SCSI-II
- ▶ 500,000MTBF

INTERNAL $1499

EXTERNAL $1599

BARRACUDA IV / 4.1GB

ST15150N

- ▶ 3.5", 8ms
- ▶ 7200RPM
- ▶ Fast SCSI-II
- ▶ 500,000MTBF

INTERNAL $2499

EXTERNAL $2629

ST12550W Fast Wide SCSI-II....$1789

IDE

CAPACITY	M/N	CACHE	SPEED	SIZE	PRICE
210MB	ST3243A	---	16ms	3.5"x1"	...............$199
245MB	ST3283A	128K	12ms	3.5"X1"	...............$269
263MB	ST3290A	64K	16ms	3.5X1"	................$239
341MB	ST3391A	256K	13ms	3.5X1"	................$299
452MB	ST3550A	256K	12ms	3.5X1"	................$309
545MB	ST3655A	256K	12ms	3.5X1"	................$399
130MB	ST9145AG	64K	16ms	2.5" NOTEBOOK	........$259
209MB	ST9235AG	64K	16ms	2.5" NOTEBOOK	........$339

SCSI

CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
344MB	ST3390N	256K	12ms	3.5"x1"	$349	$459
456MB	ST3550N	256K	12ms	3.5X1"	$339	$449
545MB	ST36550N	256K	12ms	3.5X1"	$449	$559
1.05GB	ST11200N	256K	10.5ms	3.5"	$749	$859
1.0GB	**ST31200N**	**256K**	**9ms**	**3.5"x1"**	**$699**	**$719**
1.4GB	ST41651N	256K	15ms	FH	$1099	$1299
1.7GB	ST11900N	256K	9ms	3.5"	$1099	$1219
1.6GB	ST11950N	1024K	8ms	3.5"	$1249	$1359
2.1GB	ST42400N	256K	11ms	FH	$1599	$1799
2.1GB	ST12400N	256K	9ms	3.5"	$1249	$1359
2.1GB	ST12550N	1024K	8ms	3.5"	$1499	$1629
2.9GB	ST43400N	512K	10ms	FH	$1999	$2199
2.9GB	ST43401N	512K	10ms	5.25	$2199	$2499
4.1GB	ST15150N	7200RPM	8ms	3.5"	$2499	$2629
4.3GB	ST15230N	7200RPM	8ms	3.5	$2199	$2319
9.0GB	ST410800N	512K	11.5ms	5.25	$4599	$4799

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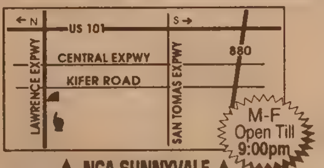

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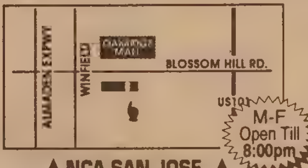

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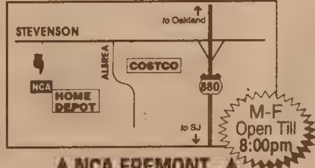

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Brand new with 5-year factory warranty

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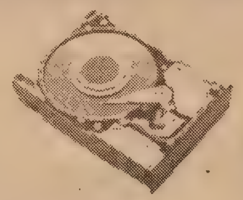
1.0GB 3.5"X1" FAST SCSI-II

- MC4110S
- 8.5ms Seek Time
- 512K Cache
- 5400RPM
- 3.5"X1" Low Profile



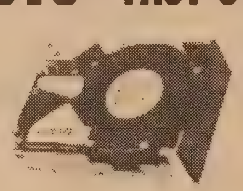
Novell Labs Tested & Approved

$669

EXTERNAL...$779

1.75GB 3.5" FAST SCSI-II OR IDE

- MC2217S/A
- 10ms Seek Time
- 5400RPM
- 3.5"



$899

EXTERNAL...$1039

IDE

	MODEL	RPM	SPEED	SIZE	INTERNAL
1.05GB	MC4110A	5400	8.5ms	3.5"	$669
1.75GB	MC2217A	5400	10ms	3.5"	$929

SCSI

	MODEL	RPM	SPEED	SIZE	INTERNAL	EXTERNAL
1.0GB	MC2210	5400	10ms	3.5"	$729	$839
1.0GB	MC2210AV	Audio/Visual			$899	$1029
1.05GB	MC4110	5400	8.5ms	3.5"X1"	$659	$769
1.4GB	MC1908	5400	11ms	FH	$1249	$1449
1.75GB	MC2217	5400	10ms	3.5"	$829	$1039
1.75GB	MC2217AV	Audio/Visual			$1099	$1229
1.75GB	MC2217DW Fast Wide Differential				$1299	$N/A
1.8GB	MC1548	3600	14ms	FH	$1499	$1699
2.0GB	MC1926	5400	11ms	FH	$1399	$1599
3.0GB	**MC1936**	**5400**	**11ms**	**FH**	**$1999**	**$2199**
3.0GB	**MC1936AV**	**Audio/Visual**			**$2299**	**$2499**

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Fault-Tolerant Disk Arrays

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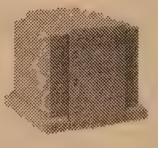

Stackable External Subsystems

HEWLETT PACKARD

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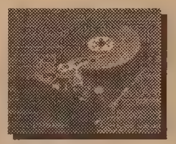
High Quality Hard Drives

2.1GB 3.5" FAST SCSI-II

- HP C2490
- 8.9ms Seek Time
- 6400RPM
- 500,000RPM
- 5-Yr. Warr.
- 57 Mbits/s Trans. Rate
- Up to 10Megabytes/s (synchronous)



EXTERNAL.....$1459 **$1349**

1.05GB 3.5" SCSI-II

Formatted Capacity

- HP C2247
- 10.5ms Seek Time
- 5400RPM
- 300,000 MTBF
- 5-Yr. Warr.
- Up to 24 Mbits/s Trans. Rate
- Up to 10 Mbytes/s Trans. Rate (synchronous)

EXTERNAL $889 **$779**

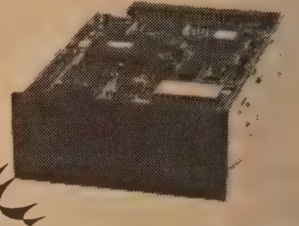
FUJITSU®

Lowest* Price Guaranteed

1.0GB SCSI-II 3.5"

M2624ESA

- 3.5" HH Drive
- 12ms Seek Time
- 64K Read/Write Cache(SCSI)
- 5-Year Warranty



$699

Novell Labs Tested & Approved

5 YEAR WARRANTY

LOWEST NCA PRICES EVER

SCSI

CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
240MB	M2637SA	Notebook	11ms	3.5"	$359	N/A
530MB	M2684SA*STATE OF THE ARE*				$399	$519
1.0GB	M2694ESA	256K	10ms	3.5"	$729	$839

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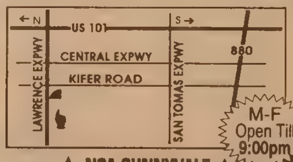

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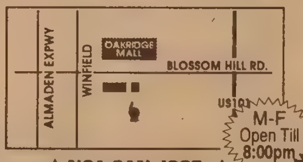

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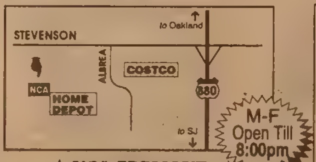

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NEW Barracuda
EXTERNAL SCSI DEVICES
for PC, MAC, SUN, & SGI

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- EXTERNAL SCSI TAPE DRIVES
- EXTERNAL SCSI CD ROMS
- EXTERNAL SCSI OPTICALS
- EXTERNAL SCSI REMOVABLES

for 3.5"/5.25" or CD- ROM drives

$99

for Full Height drives

$139

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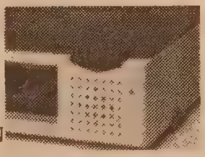
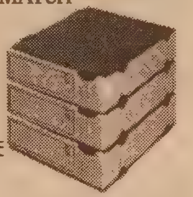


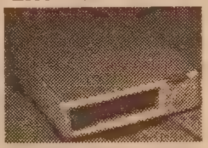
The Barracuda series guarantees protection for your sensitive M/O drive heads by a specially designed filter system that can be removed and washed as often as you think is neccessary. The drives are also protected by a refined ventilation system that ensures a steady flow of air.

DISK ARRAY DESIGN:



The entire Barracuda series has been designed to match the hardware structures as defined by Disk Array. All models feature and an AC-OUT socket at the rear panel, a state-of-the-art cooling system, and (optional) brackets that allow for the continuous stacking of additional mass storage devices.

FLEXIBLE POSITIONING:



With the Barracuda series, you can offer customers a variety of operation options. All cabinets can be used in either horizontal or vertical position and feature (optional brackets) that enable you to stack as many storage systems as you can.

UNIVERSAL POWER INPUT:

Ranging from 90-265 VAC, the Barracuda series power supplies are approved by UL, CSA and TUV, and as they boast a metal made precision structure, your mass storage system will definitely meet FCC & BZT(FTZ) requirements.

DISTINCT VISUAL IDENTITY:

The Barracuda has been designed to accommodate the broadest range of external mass storage products while giving you theadvantage of clear design characteristics that are neccessary to establish a distinct image and brand name awareness.

OPTIONS:

REMOVABLE H.D.D. KIT — $49

Thanks to a special frame design hard drives can be easily removed, while the power is automatically cut off to protect the circuits, and if you consider that there is even an ID switch connector for SCSI, you will certainly agree that the Barracuda series is much more that just a pile of boxes...

STACKER KIT includes: — $19

4 Stackable Brackets, SCSI 50 to 50 Centronics cable (<10"), Power cord male-female(<10")

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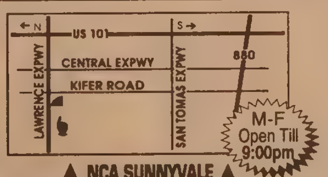

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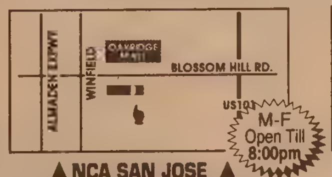

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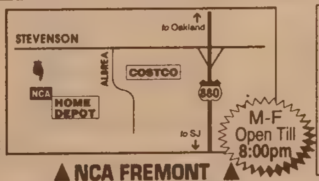

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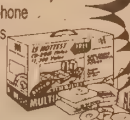
- •16-Bit Digital Stereo Sound Card
- •Incredible Double Speed CD-ROM Drive
- •320ms Access Time
- •Photo CD Multimedia Ready
- •Condensor Microphone
- •Amplified Speaekrs
- •9 Software Titles

MV2000



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SUPER DELUXE Multimedia Kit

NEW!

- •16-Bit Digital Stereo Sound Card
- •Incredible Double Speed CD-ROM Drive
- •320ms Access Time
- •Photo CD Multimedia Ready
- •Condensor Microphone
- •Amplified Speaekrs
- •15 Software Titles

MV3000

$379

PREMIUM DELUXE Multimedia Kit

- •Double Speed 180ms SCSI-2 Reno Portable CD-ROM & Audio Disc Player
- •Premium 16-Bit Sound Card
- •15 Software Titles
- •Protective Carrying Case
- •Two Powered Speakers
- •Microphone & Headphones

MV4000

$499

PRO DELUXE Multimedia Kit

NEW!

- •Triple Speed 195ms SCSI-2 CD-ROM
- •Premium 16-Bit SCI-2 Sound Card
- •15 Hot Software Titles
- •Protective Carrying Case
- •Two Powered Speakers
- •Microphone & Headphones

MV5000

$679

PRO AUDIO STUDIO 16 SOUND CARD

- True Stereo Sound
- Advanced 20 Voice Stereo Synthesizer
- MIDI/SCSI interface
- Voice Recognition
- Microphone & S/W

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MEMPHIS External Multimedia System

Dual speed CD ROM and a high power CD Audio Player in one compact ergonomic design.

• Double speed SCSI Multisession photo CD Compatible Drive • Includes 16-Bit Digital Audio Card & the most popular CD Titles

$489

Reg. $699

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PRO 16 MULTIMEDIA SYSTEM III

- • **Triple Speed Multimedia Upgrade Kit**
- •Triple Speed CD ROM
- •450Kb/Sec 195ms
- •250K Buffer
- •Pro Audio Spectrum 16 Sound Card
- •16-Bit Recording & Play back

$659

ProAudio 16 Basic: 16 Digital Audio CD-Quality Card	$79
EXTERNAL KIT For Pro Audio Spectrum (allows SCSI Ext. Connection)	$49
MIDI Mate (External midi connector box)	$45

AITech AUDIOSHOW Audio & Video

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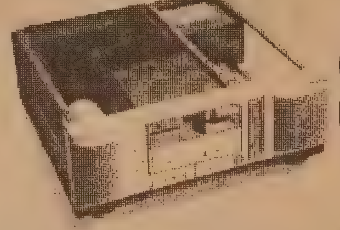
MultiMedia Computer Case

30Watts per Channel

30 Watts of Power per Channel
Power Supply UL Rated
Four Drive Bays
Front Controls and Jacks
State of the Art Quatlity and construction



$119

NCA can Build your Unique Dream MultiMedia Machine to your Specs. We Offer More Options so you can have a choice.

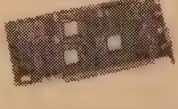
ORCHID SEE Page 23

SIGMA DESIGNS®

REELMAGIC COMPLETE MULTIMEDIA UPGRADE KIT

- ▶ Double Speed CD-ROM
- ▶ High Quality Speakers
- ▶ Bundled Software Titles, & ReelMagic Controller Card

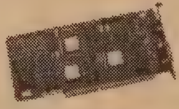
$594



REELMAGIC LITE QUALITY VIDEO & CD QUALITY AUDIO CONTROLLER CARD

- ▶ Plays Video CD feature films on your PC
- ▶ On-board MPEG Video and Audio Decomporession
- ▶ 32,768 Color in any mode - 30 fps - Full screen Size

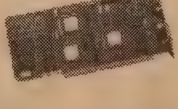
$279



REELMAGIC THEATER QUALITY VIDEO & CD QUALITY AUDIO CONTROLLER CARD

- ▶ Plays Video CD feature films on your PC
- ▶ On-board MPEG Video and Audio Decomporession - 16-Bit Sound Capability
- ▶ 32,768 Color in any mode - 30 fps - Full screen Size
- ▶ Supports IDE CD-Rom Drives

$359



REELMAGIC SCSI QUALITY VIDEO & CD QUALITY AUDIO CONTROLLER CARD

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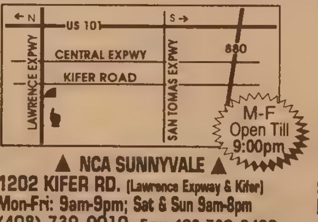

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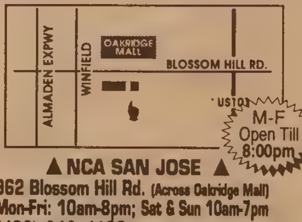

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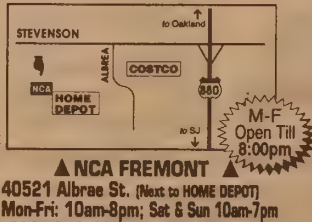

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Internal Double Speed Drive
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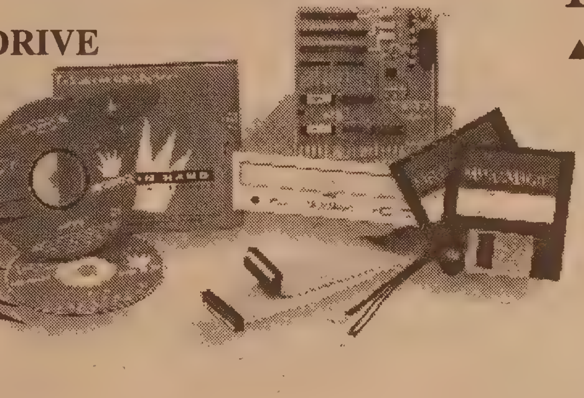

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16-Bit stereo recording and playback
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AT-bus CD-ROM interface
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Bundled Software
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- WinDAT™
- Windows Jukebox™
- Orchestrator™
- Audio Screen Saver™
- Sound Events™

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ISP-16 Sound System

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ISP-16 Audio Board
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- Dinosaurs The Multimedia Encyclopedia
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20 voice music synthesis
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Supports 8-bit PCM ADPCM compression
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DSP-16 Plus Sound System

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Stereo Computer Speakers
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- Comton's Encyclopedia
- The Mayo Clinic
- Dinosaurs Multimedia Encyclopedia Interactive Storytime Vol. 1

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DSP-16 Plus Audio Board

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SCSI Interface
Wavetable Synthesis
Sony AT & SCSI Compatible
Bundled Software
- Audio Stataion™
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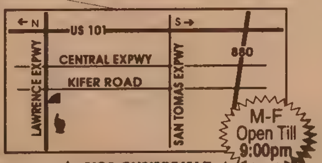

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- DISAN LAU
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12 Titles on 3 CD Discs

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- F-29 RETALIATOR
- PUSH-OVER
- EPIC
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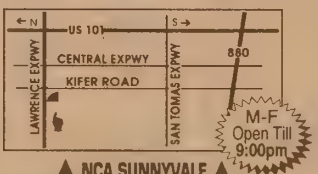

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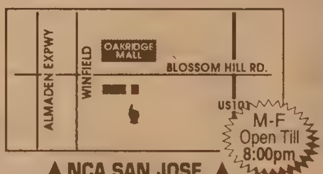

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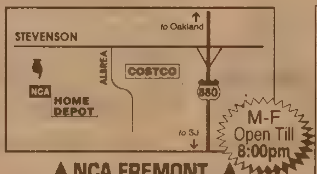

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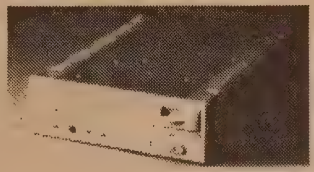
- 265ms, 335KB/Sec
- Multisession photo CD
- Anti-dust construction

INCLUDES:
2 AUDIO CABLES
Caddy Included



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EXTERNAL $279

Optional MAC Software $10

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- Controller Card
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Kit packaged by MediaMagic

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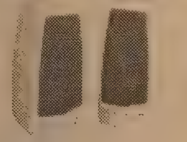

Includes AC Power Adapter
64555

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Sheilded Stereo Speakers **By RECOTON** 64540	$9.99

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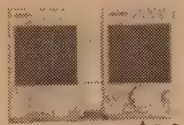

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SEE AD ON PAGE 15

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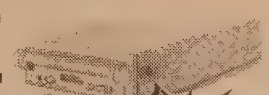

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- External SCSI/SCSI-2 Subsystem
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High Performance SCSI-II CD ROM Drives

DoubleSpeed PLUS

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- *FAST* 240ms
- Multi-spin/330Kb/Sec.
- Caddy & Manual

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- DM-5028
- External W/Caddy

QUAD-SPEED SCSI-II INTERNAL CD-ROM DRIVE

4PLEX

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- **SCSI-II QUAD SPEED**
- 150ms, 600KB / Sec
- 1MB Buffer
- Multisession Photo CD
- 2 Yr. Warranty

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3401B

- SCSI-II Fast DUAL SPEED CD ROMs
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- Caddy Included

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- 300KB/Sec. DOUBLE SPEED
- Kodak Multi-session
- Includes card & cable

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- 250ms 300Kb/Sec
- Includes Card & Cables

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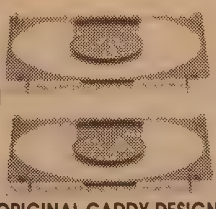
CD ROM CADDIES



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Audio Cables for most CD-ROMs & Sound Cards **$5.99** Ea.

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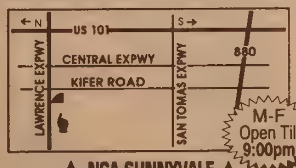

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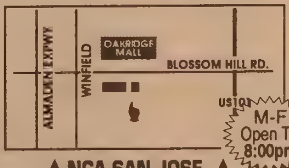

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CD ROM KITS & D

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CHINON

Dual Speed, Multisession-A Multimedia Workhorse!

Photo CD

PC Computing BEST
October 1993
Chinon CDX-535

PC MAGAZINE EDITORS' CHOICE
February 22, 1994
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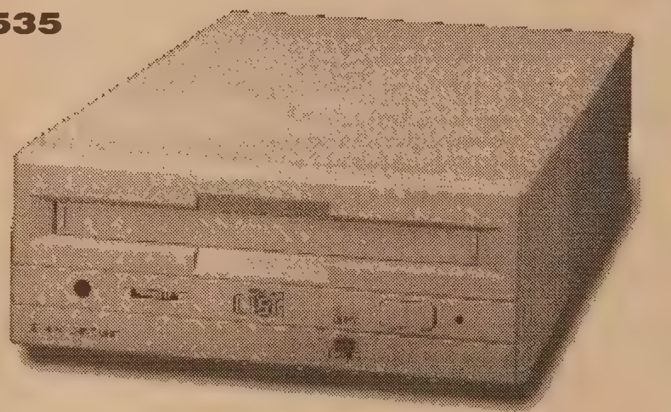
CD-535



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The 535 Series CD-ROM drives are proven multimedia performers designed to excel in both MPC and QuickTime applications. Available for either internal or external installation, these drives work with ISO 9660, High Sierra, Macintosh HFS, XA, Multisession Photo CDs and standard audio compact disks.

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With SCSI Controller Card, Software & Terminator

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- ▶ 256K Buffer
- ▶ 220ms Seek Time
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Internal Unit Only.....$309
Includes Caddy & Manual

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With SCSI Controller Card, Software & Terminator

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- ▶ Multisession Photo CD
- ▶ XA Compatible
- ▶ 220ms/256K Buffer
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- The most valuable CD ROM titles Bundle includes
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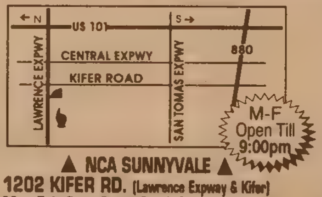

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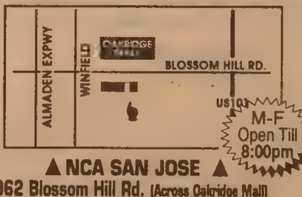

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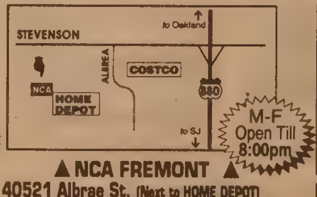

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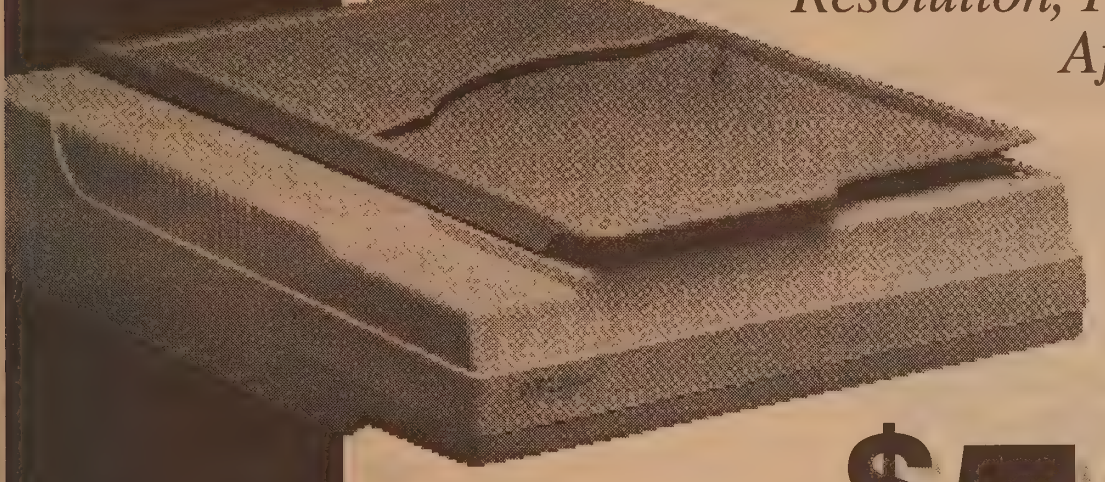
RELISYS

High-Quality Scanning! Scanning with Spectacular Color, Crisp Resolution, PinPoint Accuracy, and an Affordable Price



AVÉC *Colour* 2400

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2400DPI
FLATBED COLOR SCANNER
FOR PC or MAC

ColdScan?

ColdScan is a revolutionary new concept in scanning technology that allows the avéc and Relisys' optical system to be completely enclosed. The result...

- •Dust-Free & particles sealed out... for crisp razor-sharp scans
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- •Silent Operation... no noise from cooling fans
- •Reliable long-lasting operation... up to 35,000 hours of scanning usage.

AVÉC Colour 2400

- Flatbed desktop, 3-Pass scanner
- High Resolution up to 2400 dpi (Interpolation)
- 600X300dpi (Optical)
- 16.8 Million Colors & 256 grayscale levels
- New Cold-scan technology
- Maximum Scanning area 8.5" X 14"
- Lamp life expectancy up to 35,000 hours
- SCSI-2 Interface for Windows and Macintosh environments
- Twain compatible
- Optional 50-page Auto Document Feeder (RELI ADF30)
- One-year Warranty and HOT-LINE Technical Support.

Software Included with the Relisys Scanner:

Flatbed Color Scanner for PC

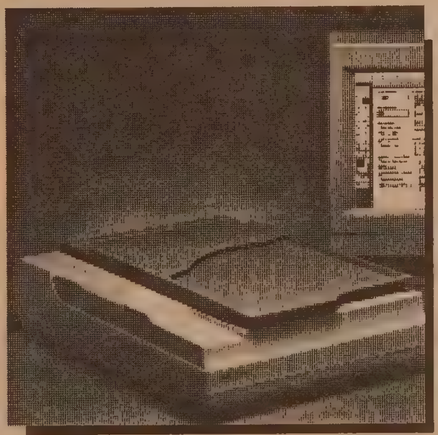
- Caere's OmniScan™
- TWAIN Driver
- SCSI Cable & Terminator
- Standard Power Cord

Flatbed Color Scanner for Mac

- Adobe Photoshop™ LE
- Art-Scan professional scanning software
- SCSI cable & terminator
- Standard Power cord

Optional Document Feeder....$399

Baby Alex's picture was scanned at 600dpi using the Relisys scanner and saved as a TIF file.



The Reli 4816(T) One Pass Color Scanner

- One Pass Scanner
- High Resolution up to 4800 dpi by interpolation (True 1600 X 400)
- 16.8 Million Colors & 256 grayscale levels
- Cold-scan technology
- Maximum Scanning area 8.5" X 14"
- Lamp life expectancy up to 35,000 hours
- SCSI-2 Interface for Windows and Macintosh enviroments
- Twain compatable
- Optional 50-page Auto Document Feeder
- One-year Warranty and HOT-LINE Technical Support.

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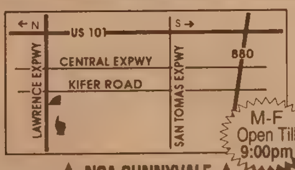

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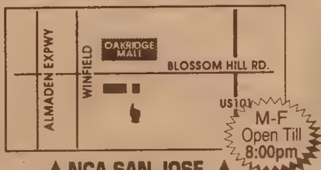

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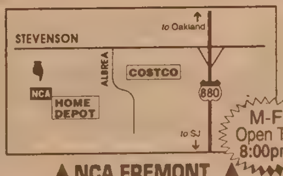

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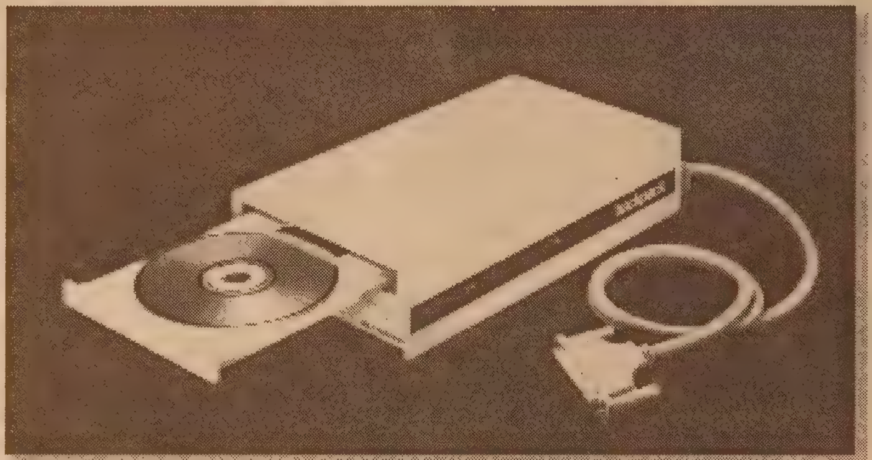
CD-ROM Drive

MicroSolutions

Double Speed Parallel port External CD-ROM Drive



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- 300Kb/Sec
- Double Speed High Performance drive
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- Supplied Device Drivers
- Multi-Session Photo CD compatible

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Parallel port External CD-ROM Drive

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- 128K Cache
- MultiSession Photo CD compatible
- Ideal for Notebooks or Desktops
- Supplied Device Drivers
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Parallel port 250MB External Tape Backup

- QIC 80 uses 2120 tapes
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- Window and DOS Software Included
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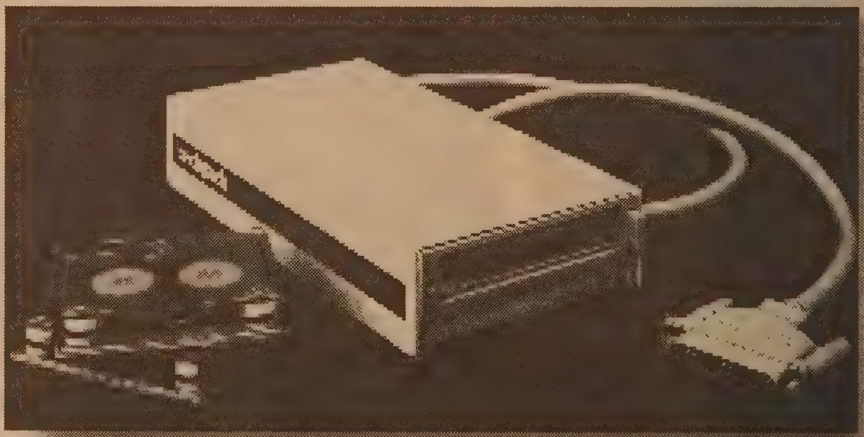

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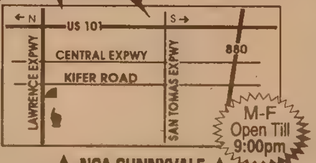
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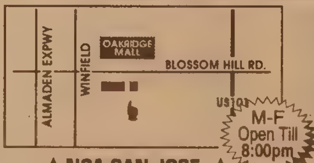
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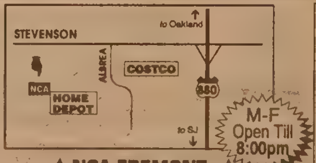
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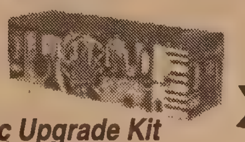

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Learn To Play The Piano, Create And Jam With Your Own Computerized Band!

•Crescendo™ includes a full-size professional 49-key music keyboard, the Miracle Piano Teaching system™ software, Wave/SE™ sound editor Stratos™ MIDI sequencer software, and Band-In-A-Box™ musical accompaniment software.

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rio *Professional MIDI Synthesizer Module*

•Add Turtle beach quality MIDI sound to your Turtle Beach Tahiti, Sound Blaster 16 or any other WaveBlaster compatible synthesizer connector.
•Ability to add new instruments via our SampleStore™ sample RAM. Never be limited to factory supplied instrument again. Comes with 256K of RAM for new samples, user upgradable with standard SIPPs to 4MB.
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•Now you can have all of the power of today's hottest new sound cards, plus a few new wrinkles, and keep your old sound card around for games!
•Ability to add new instruments via our SampleStore™ sample RAM. Maui is definitely the best of both worlds!

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monterey *Multimedia Sound Card*

Digital Audio, Stereo Mixer, MIDI Synthesizer, Digital Signal Processor, Audio Performance, MIDI Interface (Sample Store)

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Professional Sound Editing Software For Your Windows 3.1 Compatible Sound Card

Wave provides recording, editing, and playback of digital sound. You can rearrange a piece of recorded music, add perfect fade-in and fade-out, choose from a wide selection of sound special effects like reverb, digital delay, unwanted pauses and mistakes from narration tracks, even create incredibly unusual system sounds. **NEW : Digital Effects Processor, On-line Context-Sensitive Help Function, Speed Controller, & Support for Microsoft Compression**

Version 2 Includes:

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Automated EQ Presets

EFX CLIPS
Automated Effects Presets

- 6 new sound processing effects
- Sound speed control
- Contex-sensitive online help
- Microsoft ADPCM compression

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THE TURTLE TOOLS

Essential tools to use your sound card or MPC to its fullest FOR MULTIMEDIA

- **Midisoft Session™** - MIDI sequencer for developing or editing musical compositions
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- **Sound Bank™** - Over 300 Sound Effects and Muscial pieces in 4 different WAV formats and Redbook audio for professional quality!

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Karaoke Software

- **Pitch Control** - with the click of a mouse you can customize any song to suit your vocal range.
- **Digital Audio Integration** - Click on RECORD, play you MIDI file and sing your heart out into the microphone to preserve the star performance of you and your MIDI band.
- **Speed Control** - Alter playing speed to suit anybody, old or young.
- **TrueType™** - Font Support - Select any font from the TrueType collection to make the words look the way you want... and so Grandpa can read'em.
- **Windows Sound Card Compatible** - Turtle Beach MIDI Karaoke supports any Windows 3.1 sound card. The MIDI section is totally General MIDI compatible.
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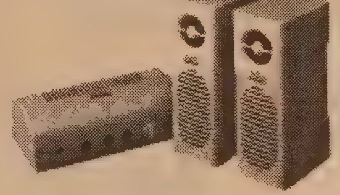
ALTEC LANSING *Audio Solutions for Computers!*

High Power Quality Multimedia System

ACS50

Personal Computer Speaker System



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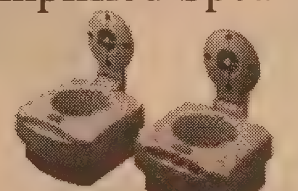
- Shielded Satellite Speakers Mount to Monitor
- Two Line-in Jacks Mix Two Audio Sources
- Volume Control to Adjust Combined Speaker Output
- ON/OFF Switch to Control Power to Speaker
- Headphone Output Connector for Private Sounds Monitoring
- Amplifier Control Module with Built-In Bass & Treble Boost Circuitry

ACS100.1

Amplified Speaker System

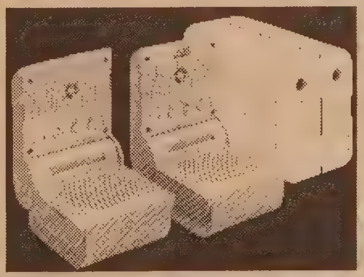


$99.99

- Volume Control to adjust Combined speaker output
- Bass Control adjusts low frequency output
- Treble Control adjusts high frequency output
- Headset Input Jack bypasses speakers for private audio monitoring
- 3 inch magnetically shielded Mid/Bass Driver
- 11mm Dome Tweeter with Ferrofluidic cooling

ACS300.1

Computer Speaker System with Subwoofer



$239.99

- Volume Control to adjust Combined speaker output
- A/B variable control for mixing the output of two sources
- Treble Control adjusts high frequency output
- Balance Control adjusts output level of each speaker
- Bass Volume for variable control of subwoofer output
- Headset input Jack bypasses speakers for private audio monitoring

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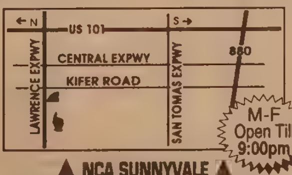

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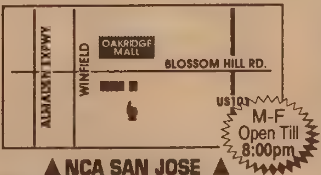

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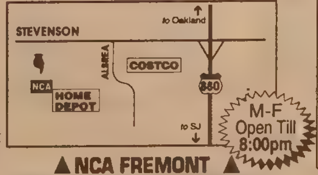

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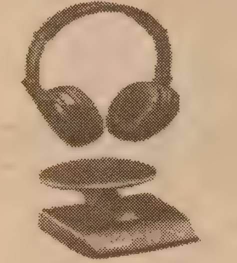
Brand Names

RECOTON®

MULTIMEDIA HEADPHONES

WIRELESS STEREO HEADPHONE



Enjoy the freedom of wireless with this Recoton W 500 Wireless Stereo Headphone. New 900Mhz signals travel through walls & Floors up to 150 ft. away! Watch & listen to your multimedia computer without disturbing others at the office or at home!

- No Wires
- No line-of-sight limitations
- Built-in rechargable battery

W500

$99

WIRELESS STEREO HEADPHONE

The ultra small receiver features volume control, tuning control, on/off switch and a belt clip. New 900Mhz signals travel through walls & Floors up to 150 ft. away! Watch & listen to your multimedia computer without disturbing others at the office or at home!

- No Wires
- No line-of-sight limitations
- Use your favorite stero head phone or the high performance headphone included

W200SX

$79

LIGHTWEIGHT DIGITAL STEREO HEADPHONES

This is a lightweight digital stereophone with foldaway earcups for compact storage. Supplied with a 1/4" adapter for home use and a convenient carrying pouch for portable applications.

EG24

$17⁹⁹

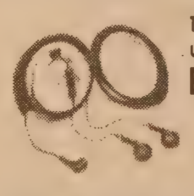
UNIQUE LIGHTWEIGHT STEREO HEADPHONES

This unique, lightweight stereophone features 30mm Samarium Cobalt speaker elements and a single entry cord with in-line volume control. Includes 1/4" adapter.

EG18

$9⁹⁹

MICRO IN-THE-EAR EARBUDS



This micro "in-the-ear" stereo earbud is supplied with a deluxe winder case and unique micro volume control.

EG36

$6⁹⁹

ATI ATronics International, Inc.

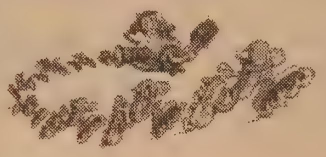
ATronics Cards & Chips: The most compatible on the market; The most user friendly on the market; the fastest on the market; and of course, they are designed and manufactured in the United States!

Thank You!

ATI-IDEal Caching Controller and Accelerator for ISA Bus

For those who want to make the best use of that extra ISA Slot, eliminate throughput bottlenecks, and not occupy CPU Time.

IDEAL *Controller*



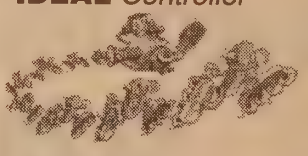
- Supports up to 16MB of on-board cache
- 0.3ms Average Disk Seek Time
- 5MB/Sec Data Transfer Rate
- Supports IDE drives up to 2GB in capacity
- Supports up to four IDE Hard Drives
- Compatible with DOS, Windows, OS/2 and major operating systems

$99

ATI-IDEal VL-Caching Controller and Accelerator for VL-Bus

Perfect for anyone with large files such as windows base applications, CD-ROM videos, and for those who HATE waiting for hard drive access!

IDEAL *Controller*



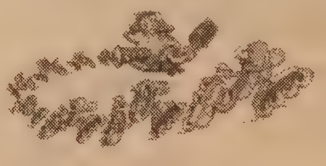
- Supports up to 16MB of on-board cache
- 0.3ms Average Disk Seek Time
- 20MB/Sec Data Transfer Rate
- Supports up to four IDE Hard Drives
- Total capacity for alldrives is up to 2GB
- Compatible with DOS, Windows, OS/2 and major operating systems

$109

ATI-IDEal-PCI ™: The IDE Controller and Accelerator for PCI-Bus

ATronics again is the 1st to introduce new technology (PCI 8/93) and ensure compatibility! ATronics, always the simple solution

IDEAL *Controller*



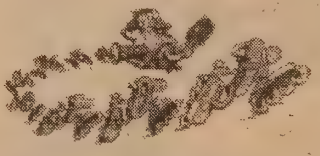
- ANSI ATA 3.0 compatible
- PCI version 2.0 compatible
- Compatible with DOS, Windows, OS/2 and major operating systems.
- **13MB Maximum PCI-bus Data Transfer Rate**
- 0.3 msec average Disk Seet Time
- Software programmable cycle times to adapt to different IDE transfer rates.
- Support up to 2 IDE hard drives

$29

ATI-IDEAL Enhancer

The Ideal enhancer is the best buy with the purchaseof your new hard drive or increasing the speed of your current hard drive.

IDEAL *Enhancer*

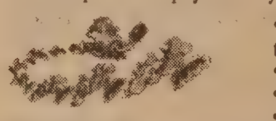


- Increase Hard Disk Performance by 40-80%
- Plug-and-Play for easy installation - no software required
- No cables to connect, no jumpers to set. Its hassle-free
- Increase your hard disk drive performance with multiple-sector transfer
- Compatible with all major operating systems

$24

DC75 VL Bus - IDE /IO

ATronics Chipset is the top of the line of compatibility! Oh, buy-the-way, we are also the fastest!



- Software Programmable cycle built-in to adapt to different IDE transfer IDE transfer rates, **no jumper setting is necessary**
- All ASIC Design, no TTL for increase reliability & Compatibility
- Support Multiple-sector transfer mode on IDE drive.
- Increases data transfer rates up to 350% over ISA cards.

$24

High Performance IDE Drive Adapter and accelerator for the PS/2 16-bit, compatible with IBM PS/2 Micro, ... $99

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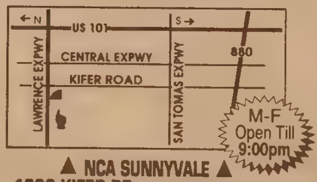

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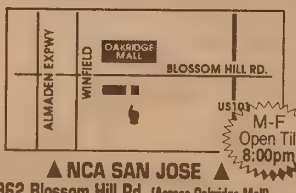

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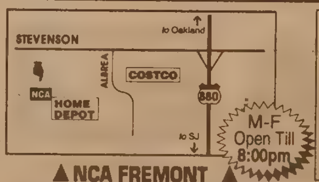

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CONTROLLERS

MORE

SCSI CONTROLLERS

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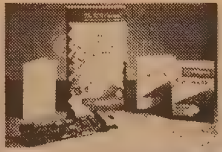


SCSI CONTROLLERS

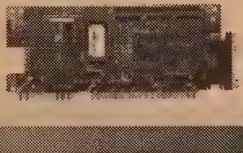
MODEL	DESCRIPTION	PRICE
1505	TOTAL CD 16-BIT SCSI-II	$59
1510	CD ROM 16-BIT -SCSI CARD KIT	$89
1522	16-BIT 7HD/2FD KIT	$139
1542CF	BUS MASTER COMPLETE KIT	$238
1542C+	BUS MASTER KIT WITH COREL SCSI	$314
1640	MICROCHANNEL FOR PS/2, 7HD	$319
2742	**EISA KIT, 14HDS**	**$299**
2742W	Fast Wide SCSI EISA	$339
2842VL	**Fast SCSI-II VESA**	**$239**
APA-460	Slim SCSI PCMCIA SCSI Card	$289
AHA-2940	PCI SCSI MASTER RISC-BASED I/O	$279
AMM-1570	**FULL SCSI WITH ADVANCED AUDIO**	**$319**

DATA TECHNOLOGY CORPORATION

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
DTC3270VL	32-Bit VESA 7SCSI/2FD SCSI	$125
DTC 3280AS	16-Bit ISA to SCSI Host Adapter	$104
DTC3280AS	EISA to SCSI 32-Bit Host w/Cache	$499

American Megatrends



SCSI CONTROLLERS

DESCRIPTION	PRICE
FastDisk NC EISA non-cache SCSI cont.	$295
FastDisk EISA Caching Controller up to 16MB	$389
FastDisk VLB VESA Local Bus Caching Controller	$393
FastLAN SCSI	$439

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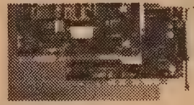

FULL KITS W/DRIVERS FOR CD-ROM/OPTICAL... ETC.

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
T228	MICROCHANNEL, 7HD	$139
T338	PARALLEL PORT to SCSI ADAPTER	$99
T348	PARALLEL PORT to SCSI PLUS	$149
T358	Parallel Port to SCSI Plus Enhanced	$189

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ASPI Device Drivers For:
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TAPEMATE II Back-up software & Music Box-Audio CD Software

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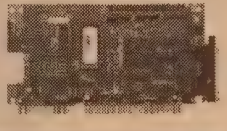
aaa always technology

Easiest to use, PLUG & PLAY with CD Drivers

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
IN2000	16 BIT 7HD/2FD "Easiest to use"	$175
IN2000PRO	With COREL SCSI	$215
AL1000	SCSI To PARALLEL	$159
AL1000PRO	Above With COREL SCSI	$185

FUTURE® DOMAIN



SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
TMC850	8-BIT W/BIOS	$59
TMC1670	SVP 16-BIT SCSI VALUE PACK	$149
TMC1680	SVP 16-BIT VALUE PACK 7HD/4FD	$139
SCSI2GO	PCMCIA FAST SCSI-II TYPE II	$279

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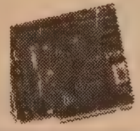

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
20	PCI SCSI Host Adapter, Sup. Wide SCSI-3	$219

BusLogic

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
BT545S	ISA Bus Master Fast SCSI Adapter Kit	$208
BT445S	**Bus Master Fast SCSI Kit for VL Bus**	**$199**
BT742A	EISA Bus Master SCSI-II Adapter Kit	$329
BT747S	EISA Bus Master Fast SCSI	$364
BT757S	FASTWIDE SCSI CARD	$369
BT946C	Bus Master Fast SCSI for PCI Local Bus	$239

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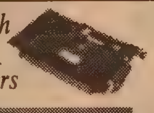
Affordable High Performance SCSI Controllers



SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
Fast! SCSI EISA	10MB per sec. fast SCSI-II	$199
Fast! SCSI ISA	16-bit PIO Data Transfer <3mb/sec	$124.99
Fast! SCSI VESA LOCAL BUS	32-bit VLB host data Transfer	$189
Fast! SCSI PCI	Bus Master support	$279
Fast! SCSI PCMCIA	Free CoralSCSI	$189

IDE CONTROLLERS

NCA'S STANDARD IDE

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
200	2HD/2FD CONTROLLER W/CABLES	$14
211	2HD/2FD W/2 SERIAL, 1PAR, 1GAME	$23
NCL53	SMART CONT. W/BIOS EASY INSTALL	$49
223	**2HD/2FD for VESA LOCAL BUS I/O**	**$59**
15C	CACHING (UP TO 8MB), 2HD, 2FD **UltraStor**	**$159**

BusLogic

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
BT510A	IDE Cache Contoller For PC/AT Sys.	$95
BT410A	IDE Cache Controller for VLB	$129
BT910A	IDE PCI Cache Controller	$139

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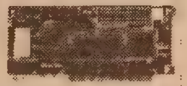

IDE CACHING CONTROLLERS

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
DC-200	ISA IDE 4HD/2FD, 2.88MB FLOPPY SUPPORT	$89
DC-420VLB	VESA IDE 512K CACHE	$99
DC-4030VL-2	VESA IDE 2.88MB SUPPORT 4HD/2FD	$109
DC-200M	ISA IDE 512K CACHE 4HD/2FD 2.88 SUPPORT	$119
DC2032	ISA Caching Controller	$139

DATA TECHNOLOGY CORPORATION

IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
DTC 2278AS	VESA Multi I/O 2s/1p/1g	$39
DTC2277VLL	VESA Caching IDE Controller	$149
DTC 2280	16-Bit Super I/O 2FD/2HD 2s/1p/1g	$19.99

WONDER 16550 IDE CARD

2 IDE DRIVES/2 FLOPPY
2 HIGH SPEED 16550 SERIAL PORTS
1 PARALLEL PORT / 1 GAME

$69

16650 I/O Controller......$45

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13-Port Super I/O Card

4 INTEGRATED NS16550 HIGH SPEED UARTs

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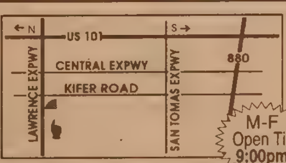

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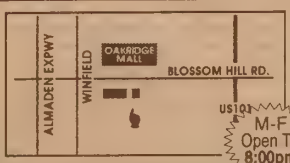

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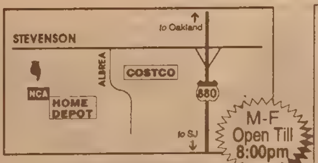

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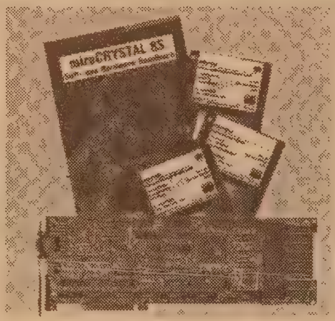
- ▶ Top Resolution of 1280X1024 Pixels
- ▶ 80Hz at 1024X768 Pixels
- ▶ ISA

Turbo-Charged Graphics for Windows



$119 ISA Bus

miroCrystal 10s

- ▶ S3 86C805 Graphics Chip with 1MByte Highspeed DRAM
- ▶ 256 Colors with 1024X768
- ▶ Top Resolution of 1280X1024
- ▶ 80Hz at 1024X768 Pixels
- ▶ VLB, PCI

$139 VLB **$149** PCI

miroCrystal 16s

- ▶ Graphics Chip S3 86C801 with 2MBytes DRAM
- ▶ 256 colors with 1408X1024 Pixels
- ▶ Top Resolution of 1408X1024
- ▶ 100Hz at 1024X768 Pixels
- ▶ VLB, PCI

$219 VLB **$229** PCI

miroCrystal 20s

- ▶ Graphics Chip S3 Vision864™ with 2MBytes DRAM
- ▶ 65,536 Colors in 1024X768 pixels mode
- ▶ Top Resolution of 1408X1024
- ▶ 100Hz at 1024X768 Pixels
- ▶ VLB, PCI

$249 VLB **$259** PCI

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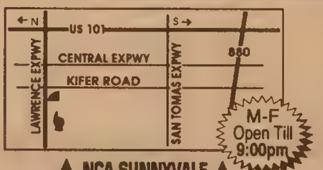
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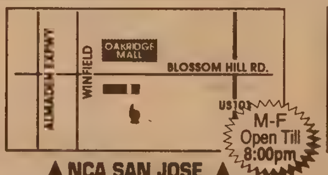
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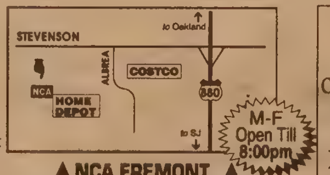
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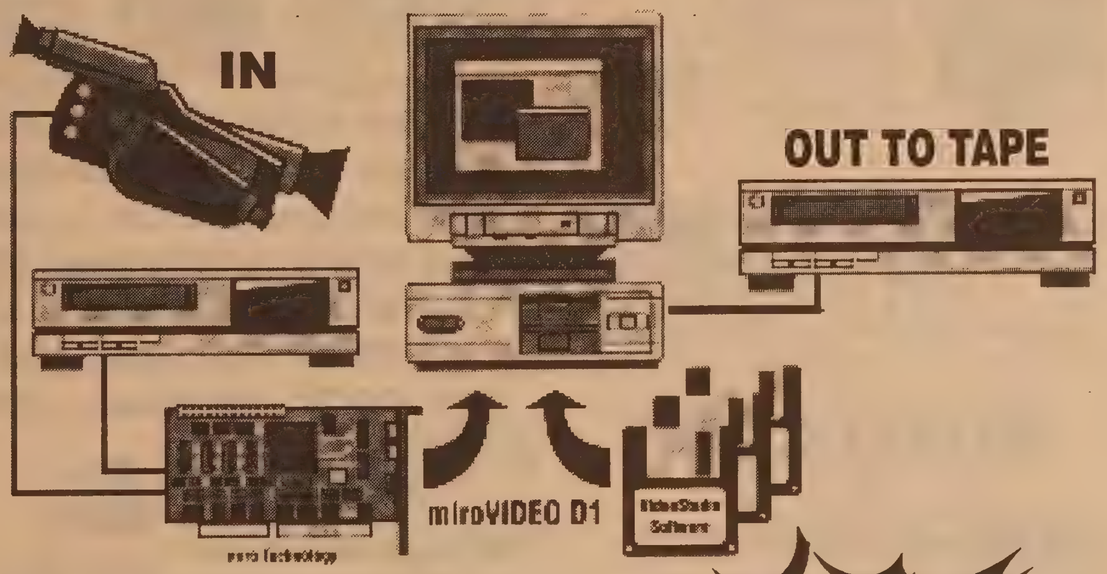
reat transition effects
igital video back up
o generation loss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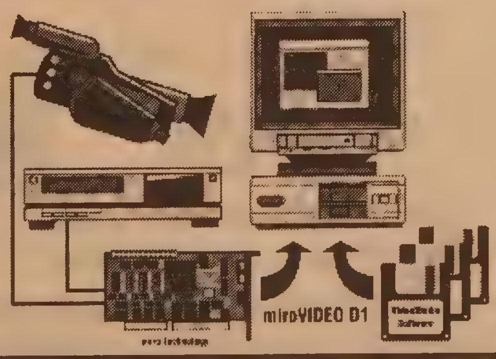
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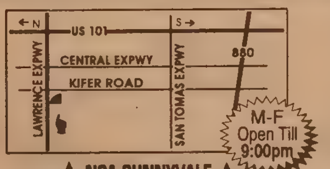
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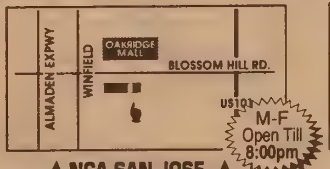
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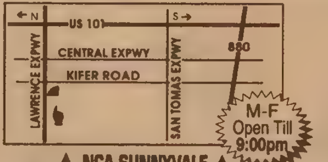

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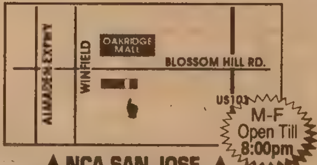

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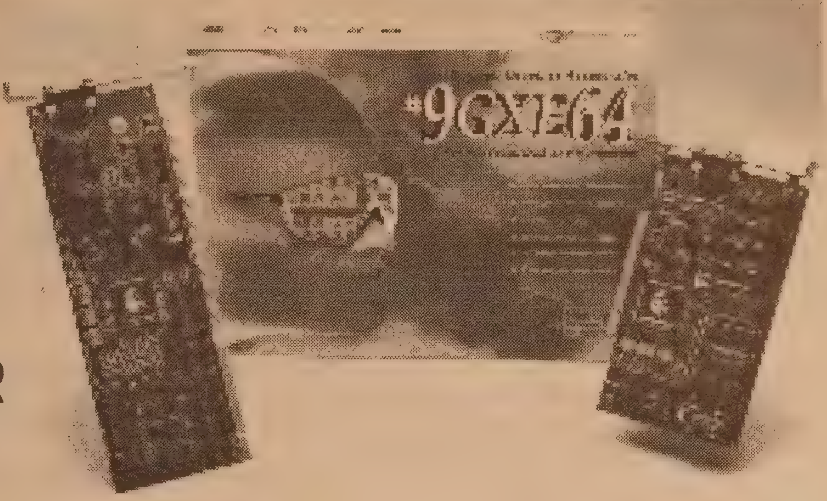

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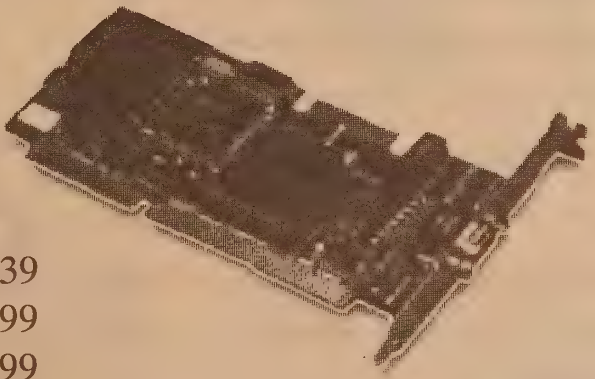

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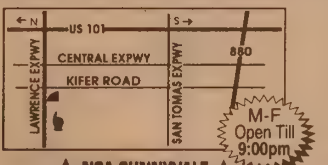

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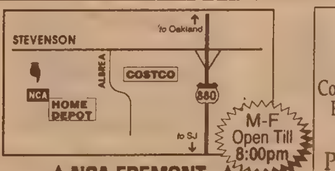

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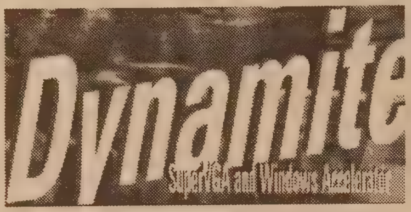

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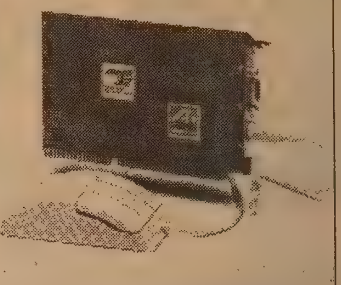

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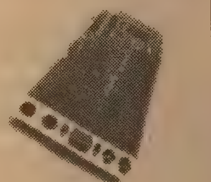

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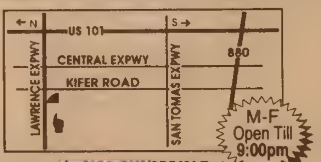

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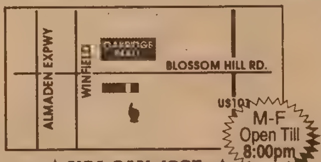

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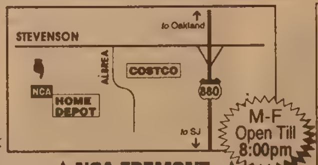

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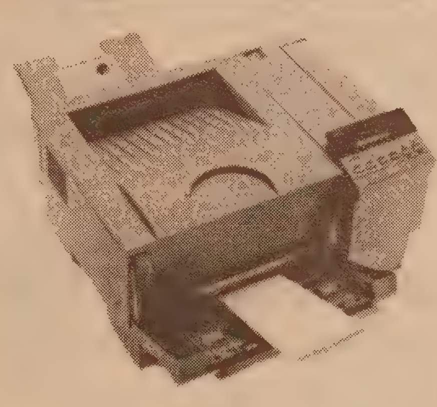

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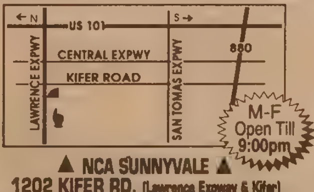

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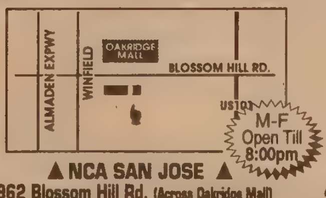

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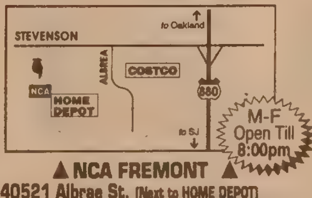

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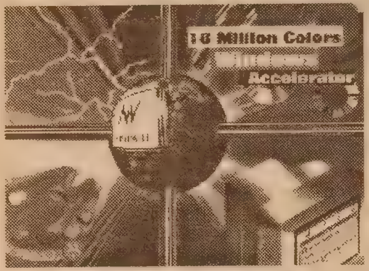
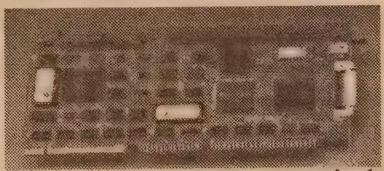
SPiDER®
Graphics, Inc.



SPiDER Windows Accelerators
16.7 Million Colors



TARANTULA 64 VLB/PCI
NEW!

NEXT GENERATION 64-BIT GRAPHICS

- 32-Bit True Color Palette DAC
- Up to 1600X1200 in 64K Colors
- True Color at 1024X768 N/I
- Energy Saving Green PC
- Virtual Screen, Resolution & Refresh on-the-fly

2MB VRAM	4MB VRAM
$285	$395

BLACK WiDOW Plus
The Power of Graphics Co-Processor

- IIT AGX-016: Co-Processor Accelerator
- Fast VRAM
- 135MHz High Color DAC up to 90Hz (NI)
- Ultra High Resolution 1600X1200
- Virtual Screen, Adjust Screen, Refresh Rate Check

1MB VRAM	2MB VRAM
$169	$239

SPiDER 256 CACHE
A Breakthrough in video Technology: Video Caching!

- 128KB Video Cache (exp. 256KB)
- 32-Bit VESA VL-Bus
- Hardware Cursor & Line Drawing, BitBlt
- 1MB of Display memory (exp. 2MB)
- 16 Million Colors
- Up to 1280X1024 in 256 colors
- Refresh Rate up to 75Hz (NI)
- Virtrual Screen, Adjust Screen and Refresh Rate Check

1MB DRAM w/128C	2MB DRAM w/256C
$129	$189

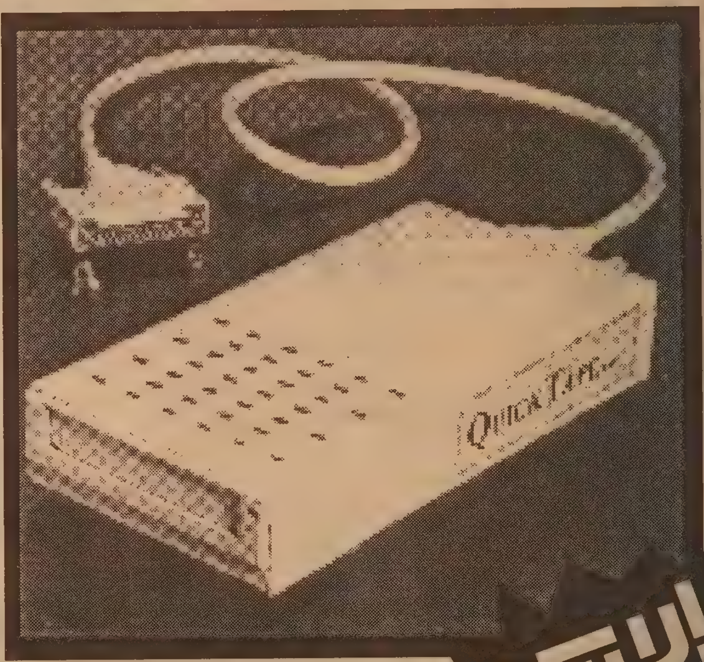
SPiDER 64VLB/PCI
64-Bit Video Accelerator Card

- 64-Bit video memory interface
- 64-Bit BitBlt
- 16 Million Color in 32-Bit/Pixel format
- 1024X768 in 16 Million Colors ; 1280X1024 in 64K Colors
- High Refresh Rate: up to 75Hz (NI)
- Display memory Expandable up to 4MB
- Virtual Screen, Adjust Screen and Refresh Rate Check
- Bus available: VESA VL-Bus and PCI

2MB DRAM	4MB DRAM
$199	$299

SPiDER 32VLB	1MB DRAM/2MB DRAM	$95/$135
SPiDER 32VLB Plus	1MB DRAM/2MB DRAM	$109/$149
BLACK WiDOW VLB/ISA	1MB VRAM/2MB VRAM	$139/$199

QUICKTAPE 250
250MB EXTERNAL PARALLEL PORT TAPE BACKUP



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Perfect for notebooks & portables!

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- 4.2MB/MIN.W/O COMPRESSION
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- USES DC2120 TAPES
- 100% QIC 80 COMPATIBLE
- INCLUDES DOS SOFTWARE

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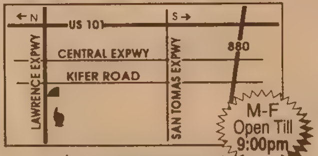

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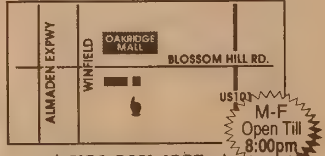

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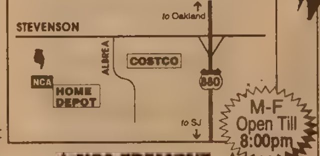

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HEWLETT PACKARD

The most reliable SCSI Tape Backups for MAC, PC or SUN

5GB External 4mm 3.5" SCSI DAT TAPE BACKUP

- •732 Kbytes/Sec Transfer Rate (Sustained)
- • 5 MB/ Sec (Synchronous)

INCLUDES: 1 CARTRIDGE & NOVABACK BACKUP SOFTWARE

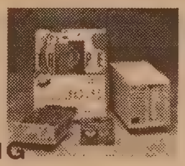
$1049

35480

SCSI 4mm DAT

CAPACITY	MODEL	INTERNAL	EXTERNAL
2.0GB	35470 DAT	$889	$999
4-8GB	35480 DAT	$979	$1049
4-16GB	C1533A	$1249	$1359

EXABYTE®



FS1G

1.5 GB SCSI Tape Storage

COMPLETE SYTEM INCLUDES:
- •Internal FS1G Tape Drive
- •Adaptec 16-Bit SCSI Controller Card
- •File Secure Software
- •Up to 30 MB/Min. Transfer Rate
- •One Data Cartridge

$729

External FS1G Kit...$939
Internal Unit (2501) $519

4mm DAT Cartridge

CAPACITY	MODEL	INTERNAL	EXTERNAL
2.0GB	EXB-4200	$849	$959
4-8GB	EXB-4200C	$949	$1039

2.5 GB 8mm DAT Subsystem

CAPACITY	MODEL	INTERNAL	EXTERNAL
2.5GB	EXB-8205	$1399	$1649

5 GB 8mm DAT Subsystem

CAPACITY	MODEL	INTERNAL	EXTERNAL
5.0GB	EXB-8505	$2069	$2499
5.0GB	EXB-8500	$2299	$2599

CONNER *The BEST name in SCSI Back-up Drives*

SOF•STOR

for IBM Compatibles, MAC, SUN, & NeXT

Formerly ARCHIVE

ANACONDA

- ◆ 36MB/MIN
- ◆ SCSI-2
- ◆ 1/4" TAPE UNIT

1.3GB 2750	**2.0GB 2800**
INTERNAL $799	INTERNAL $999
EXTERNAL $899	EXTERNAL ..$1099

VIPER™

- ◆ 6MB/MIN
- ◆ SCSI
- ◆ 1/4" TAPE UNIT

250 MB 2150S	**525 MB 2525S**
INTERNAL $319	INTERNAL $449
EXTERNAL $429	EXTERNAL $569
Int. W/Software $399	Int. W/Software $549

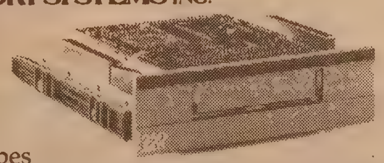
SCSI 4mm DAT Tape Backups

PYTHON™

- ◆ 11MB/MIN.
- ◆ 1MB Cache Buffer

2 GB. 4320 NT	**4 GB. 4324 TURBO**
INTERNAL $879	INTERNAL $449
EXTERNAL $989	EXTERNAL $569

COLORADO MEMORY SYSTEMS INC.



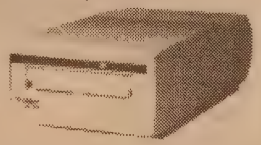
Uses 2120 Tapes

RUNS OFF FLOPPY PORT

CAPACITY	MODEL/TYPE	INTERNAL
120MB	DJ10 JUMBO120	$99
250MB	DJ20 JUMBO250	$159

EXTERNAL KIT WITH CARD AND CABLES KE-10	$109
EXTERNAL TAPE PORT AB-11	$35
FC-10 TAPE CONTROLLER, WITH CABLES	$78
TC-15 HIGH PERFORMANCE 16-BIT CONTROLLER	$168

Trakker™



PARALLEL PRINTER PORT EXTERNAL TAPE BACK-UP SYSTEMS

RUNS OFF PARALLEL PRINTER PORT

CAPACITY	MODEL/TYPE	EXTERNAL
120MB	TRAKKER 120	$279
250MB	TRAKKER 250	$319

CONNER
TAPE•STOR 250MB

TAPE BACKUP
INCLUDES 1 CARTRIDGE

INTERNAL	**EXTERNAL**
RUNS OFF FLOPPY PORT	RUNS OFF PARALLEL PORT
$149	$299

WangDAT™

Internal

4-8GB $999

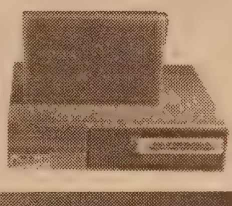
3400DX DAT Tape Backup

External $1099

SCSI 4mm DAT

CAPACITY	MODEL	INTERNAL	EXTERNAL
2.0GB	3100 DAT	$899	$999
4-8GB	3200 DAT	$999	$1099

WANGTEK

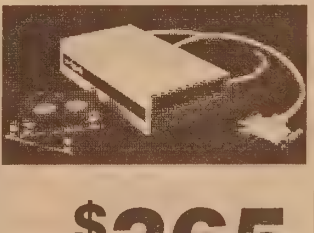


SCSI Tape

CAPACITY	MODEL	INTERNAL	EXTERNAL
250MB	5150S	$399	$499
525MB	5525S	$539	$649

backpack
Tape Drive

Parallel Port 250MB External Tape Backup



- ▶ QIC 80 uses 2120 tapes
- ▶ Software for unattended backups
- ▶ Twice as fast as internal floppy drive
- ▶ Window and DOS Software Included
- ▶ 2 Year Warranty

$365

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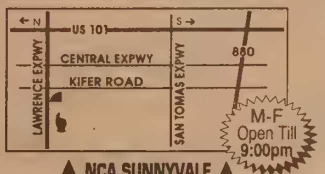

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1.3GB Multifunction
Rewritable & WORM Drive

- ▶HP C1716T
- ▶SCSI-2 1.3GB

INTERNAL $2399

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1.3GB Cartridge........................$129

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128MBYTE, 3.5" SCSI-II REWRITABLE OPTICAL

- ▶3000 RPM
- ▶256K Cache
- ▶Approx. 40ms

INTERNAL $719

EXTERNAL WITH CARTRIDGE $889

Multifunction Magento-Optical Disk Drive for 1-Gbyte and 650-Mbyte Rewritable and WORM Disk Cartridges, With up to 4-Mbytes Read/Write cache

Maxoptix™

1GB CART. glass/poly $195

Unlimited Data Storage
- ▶ External SCSI Subsystem
- ▶ One Year Factory Warranty
- ▶ 25-Year Life Of Glass Media
- ▶ Embedded SCSI/SCSI-2
- ▶ Data Transfer of up to 13.2Mbits/Sec.
- ▶ Ultimate Back-up For NOVELL (Ready-to-boot Backup)

TAHITI IIM - Multifunction
- ▶ 1MB Read/WriteCache
- ▶ External SCSI
- ▶ 35ms

$2199

TAHITI IIM - Multifunction
- ▶ 4MB Read/Write Cache
- ▶ External SCSI
- ▶ 35ms

$2399

TAHITI IIIM - Multifunction
- ▶ 1MB Read/Wirte Cache
- ▶ 1.3GB Optical

$2099

External Optical/1MB Cache....$2399

TAHITI IIIM - Multifunction
- ▶ 4MB Read/Wirte Cache
- ▶ 1.3GB Optical

$2299

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DynaMO™ 128
5-Year Warranty

128MB REWRITABLE, REMOVABLE OPTICAL SCSI DRIVES

EXTERNAL SCSI 128MB, 3.5" REWRITABLE OPTICAL

- ▶ External Optical Drive
- ▶ Using 2511A Internal
- ▶ Includes 1 Cartridge
- ▶ Fast 30ms Seek Time
- ▶ 3600RPM
- ▶ 256K Cache
- ▶ Software for MAC (free upon request)

$859

M2512 230MB.......$829

PC VERSION W/ CONTROLLER......$959

INTERNAL 128MB, 3.5" REWRITABLE OPTICAL

- ▶ Bare Optical Drive
- ▶ 2511A
- ▶ Low Profile, Only 1"
- ▶ 3600RPM
- ▶ 256K Cache
- ▶ Fast 30ms Seek Time

$739

DYNAMO 128MB 3.5" CARTRIDGE $39

REMOVABLES

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270MB SYQUEST REMOVABLE

External SCSI Drive
- External 270MB 3.5" SCSI Removable Cartridge Drive
- Unlimited Storage Capacity
- 270MB External Drive
- Cables & Software for MAC
- 13.5ms Seek Time
- Includes one cartridge

$569

Internal Bare Drive $389

200MB SYQUEST REMOVABLE

External 200MB Drive NEW!
- 200MB Cartridge
- Cables
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

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Internal Bare Drive $469

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External 44MB Drive
- 44MB Cartridge
- Cables
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

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Internal Bare Drive $239

88MB C SYQUEST REMOVABLE

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- 88MB Cartridge
- Cables
- Reads & Write Both 44 & 88 MB
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

$459

Internal Bare Drive $279

105MB 3.5" SYQUEST REMOVABLE

External SCSI 105MB Drive
- 14ms Seek Time
- 105MB Cartridge
- Cables
- Installation Software (for MAC)
- PC Software Included With Controller Purchase

$429

Internal SCSI Bare Drive $279
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CAPACITY	SINGLE	5-PACK
44MB Cartridge (5.25")	$59	$295
88MB Cartridge (5.25")	$95	$459
105MB Cartridge (3.5")	$59	$295
200MB Cartridge (5.25")	$99	$475
270MB Cartridge (3.5")	$89	$445

TEAC

1.44MB 3.5" With bracket add $6	$37
1.2MB 5.25"	$47
1.2/1.44MB Dual Drive	$99

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IOMEGA®

floptical®

21MB Floptical Drive

MAC Version

INCLUDES:
- External 3.5" 21MB Floptical
- One Floptical Media
- Cables , Software for MAC

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21MB MEDIA BY IOMEGA LASER ETCHED
SINGLE ......$19.99 5-PACK......$89.99

PC Version

INCLUDES:
IOMEGA 21MB 3.5" Floptical
One Floptical Media
Host adapter SCSI 8-bit
Cables , Software for PC

INTERNAL $369

EXTERNAL $429

21MB MEDIA BY IOMEGA LASER ETCHED
SINGLE ......$19.99 5-PACK......$89.99

BERNOULLI

150MB EXTERNAL PC TRANSPORTABLE

- Cables
- One 150MB Cartridge

$539

90MB BERNOULLI REMOVABLE
PC VERSION $339
MAC Transportable $339

BERNOULLI CARTRIDGES	SINGLE	3-PACK
65MB	$59	$169
90MB	$109	$309
105MB	$99	$269
150MB	$109	$309

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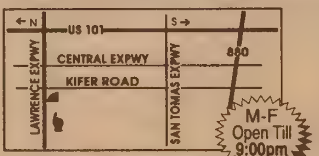

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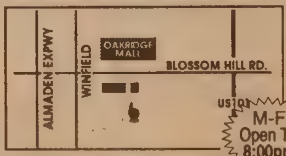

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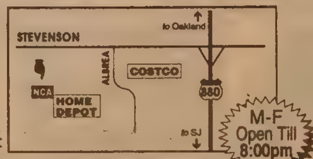

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NETWORK

FAX/MODEMS

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16-bit, 10 Base T and Coax Combo	$109	459	2395
16-bit, Coax Cards or 10 Base T Cards	$109	439	1799

Ethernet Express Flash Cards	Single	5-Pack	20-Pack
16-bit, 10 Base T and Coax Combo	$134	624	2399
16-bit, 10 Base T or Coax Cards	$119	539	1899
32-bit 10 Base T of Coax Cards	$229		

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NetPort for 10 Base T or Coax	$398

SMC

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6-bit, Combo Board	$119	545	2549
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2 Port Hub	$599		
etwork Managment Module	$415		
wisted Pair Hubs			
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ite 10 Base T w/12 RJ-45 with SNMP	$899		
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Com

OM

herLink II - 3C503 16-bit 10 Base T / Coax	$167/167
herLink III - 3C509 10 Base T or Coax	$529 5 Pack/119 Single
herLink III - 3C509 Combo Card 16-bit	$519 5 Pack/129 Single
herLink III - 32-bit EISA 10 Base T or Coax	$229
MCIA - 3C589 10 Base T/Combo	$189/239
kBuilder - 3C16270 - 12 port Hub	$339

NOVELL.

VELL	single	5-Pack
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2000 plus Combo	$133	549
3210 32-bit EISA Combo	$213	

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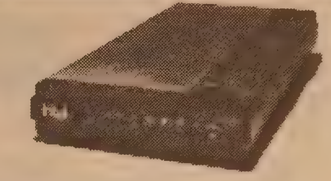
	5 user	10 user	25 user	50 user	100 user	250 user
	$599	$1299	$1899	$2499	$3649	$6499
	$819	$1793	$2599	$3594	$5395	$9694

CIAL OFFER

it Card with Novell Lite 1.1	$99
dman 10 Base T or Coax 8-bit/16-bit	$59

intel®



FAX/MODEM Group III FAX
V.32bis 14,400 bps data Includes WinFax Software. 5-Yr. Warranty

14.4 Internal Fax/Modem...$109

14.4 External Fax/Modem.......$139

SatisFAXtion 400™ 14.4 Fax/Modem • MNP5/V.42/V.32
Internal...$259 External 400e.$289

PCMCIA 14.4 Fax/Modem........$199

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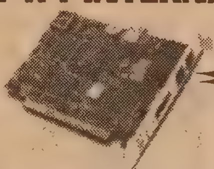
HIGH SPEED FAX/MODEMS

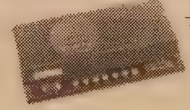
SPORTSTER 14,400 V.32/V.42

WITH QUICKLINK LITE SOFTWARE

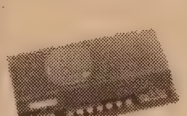
14.4 INTERNAL for PC $99



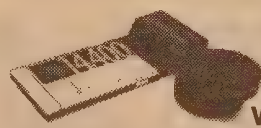
mac&fax SPORTSTER $139



14.4 EXTERNAL for PC $129



14.4 PCMCIA Fax/Modem



$189 World Port

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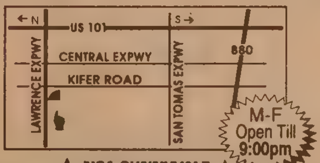

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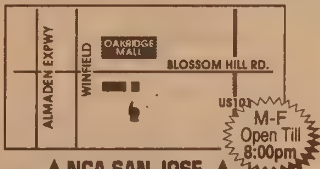

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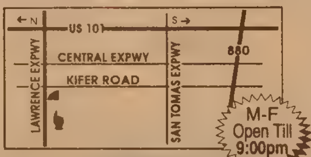

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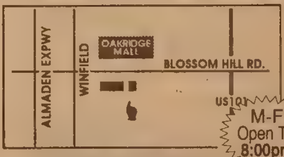

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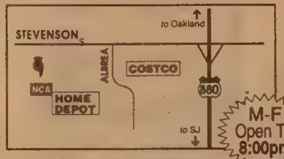

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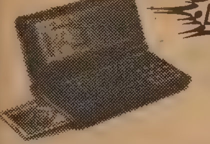

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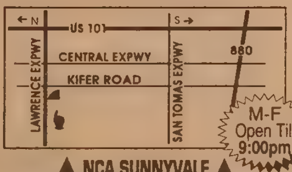

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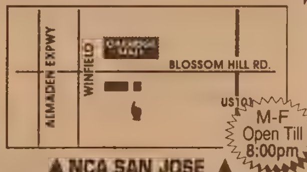

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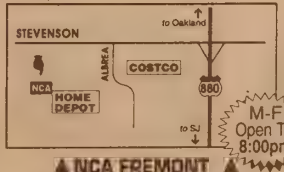

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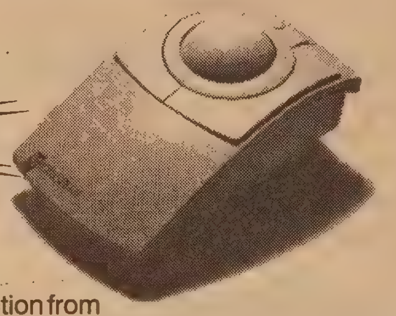

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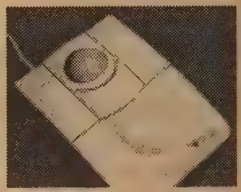

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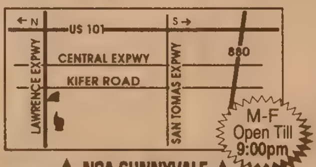

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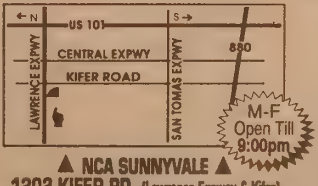

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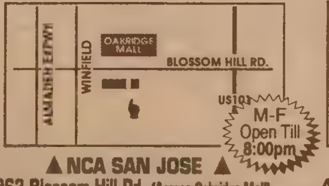

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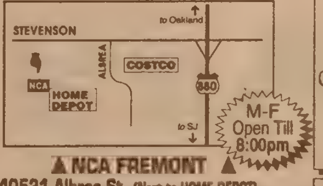

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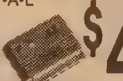

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POINTING DEVICES

LOGITECH

SEE PAGE 31

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NAME	PRICE
PC-TRAC serial/bus/PS/2	$\$58^{99}/99^{99}/79^{99}$
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WinTRAC serial for Windows	$\$79^{99}$
MicroTRAC serial, PS/2/MAC	$\$57^{99}/65^{99}$

MOUSE SYSTEMS

SEE PAGE 30

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NAME	PRICE
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3M 2120F FORMATTED XMAT	18.00	89.00
MAXELL DC2120 UNFORMATTED	16.99	79.00
MAXELL DC2120 FORMATTED Q80	18.99	89.99
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SONY QD6150 150MB	$19.95	$90.00
SONY QD6250 250MB	$19.99	$90.00
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MAXELL D6525 525MB	$24.99	$117.00
3M DC6525 525MB	$29.95	$145.00
3M MAGNUS 1.6GB	$CALL	$CALL
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SONY 90M	$14.99	$65.00
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SYQUEST 88MB SQ800	$95	$459
SYQUEST 105MB 3.5"	$59	$295
SYQUEST 200MB 5.25"	$99	$475
SYQUEST 270MB 3.5"	**$89**	**$445**
BERNOULLI	See pg. 24	
SONY M.O. 128MB OPTICAL	**$39**	**$185**
VERBATIM 128MB OPTICAL	**$39**	**$185**
FUJITSU DYNAMO 128MB	**$39**	**$185**
KOMAG 128MB OPTICAL	**$29**	**$139**
RICOH 128MB OPTICAL	**$45**	**$215**
MAXELL 128MB OPTICAL	**$39**	**$185**
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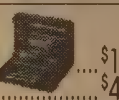

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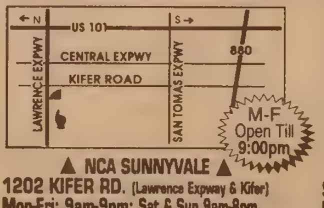

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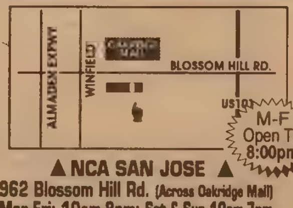

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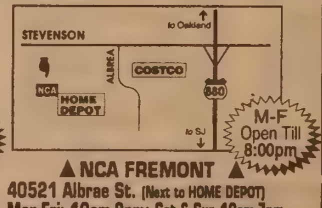

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Non-Interlaced
Flat Screen

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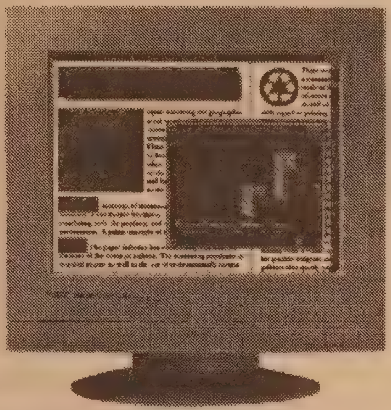
15", .28mm
1024X768
XGA-2
Compatible

$549

4FGe

15", .28mm
1024X768
Anti-Static
Flat Screen

$629



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- 1024X768
- 76Hz Refresh

$945

5FGp

- 17", .28mm
- 1280X1024
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$1075

6FGp

- 12", .28mm
- 1280X1024
- Opticlear

$1999

NOTEBOOKS

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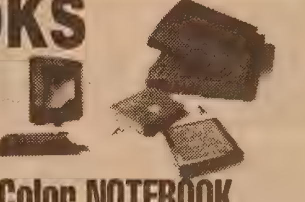

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- 2 PCMCIA Slots
- TFT Active-Matrix Color Screen
- User Removable/Reversable Screen
- MS-DOS, Windows Preloaded
- 3 Yr. Warranty

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VERSA E40 Active Color NOTEBOOK

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- SL Enhanced i486™ DX2
- 8Kb Cache
- Built-in Numeric Co-Processor
- 4MB RAM (exp. to 20MB)
- 2 PCMCIA Slots
- TFT Active-Matrix Color Screen
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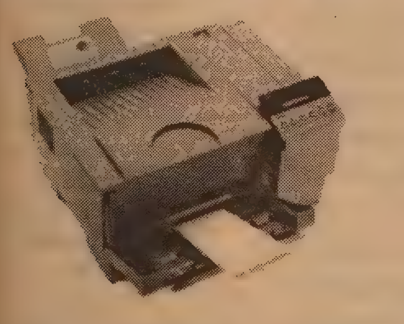

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600 DPI Postscript

- 10ppm, 600dpi laser quality
- 7MB RAM
- Level 2 PostScript/PLC-5
- 35 resident Adobe scalable
- 14HP LaserjetIII fonts

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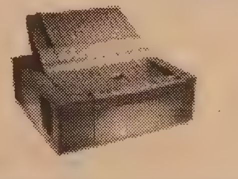

Silentwriter 95fx

- Fax Capability
- 6ppm
- 300dpi laser quality
- 2MB memory expandable to 5MB
- Envelope Feeder
- 35 resident Adobe Scalable Fonts
- Apple Talk built in

$949

Silentwriter 610

- 6ppm
- 300dpi laser quality
- Uses Memory from system CPU
- 14 Window True Type Fonts
- 20 NEC True Type Fonts

$489

Silentwriter 640

- 6ppm
- 300dpi laser quality
- 3MB RAM
- Level 2 Postscript
- 17 resident Adobe scalable
- 35 True Type Fonts

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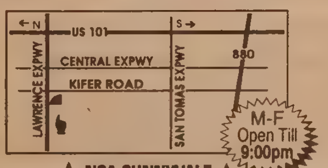

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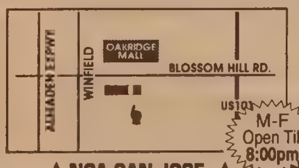

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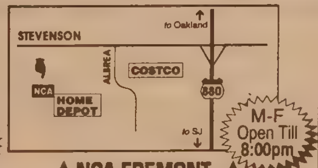

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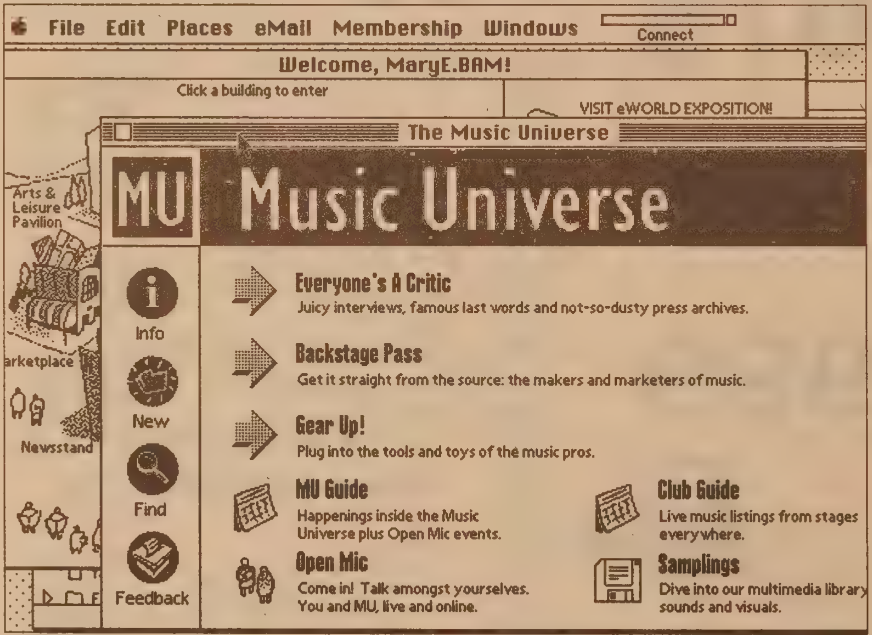
BAM Enters Music Universe

Our parent company, BAM Media, has launched its first online venture, the Music Universe, on Apple's new eWorld service. Designed to bring together music journalists, fans, musicians, and industry professionals, MU combines the strengths of print publications and interactive media, with articles, events listings, chat rooms, discussion boards, and software libraries.



Everyone's A Critic
Juicy interviews, famous last words and not-so-dusty press archives.

Backstage Pass
Get it straight from the source: the makers and marketers of music.

Gear Up!
Plug into the tools and toys of the music pros.

MU Guide
Happenings inside the Music Universe plus Open Mic events.

Club Guide
Live music listings from stages everywhere.

Open Mic
Come in! Talk amongst yourselves. You and MU, live and online.

Samplings
Dive into our multimedia library sounds and visuals.

Says *BAM* Publisher Earl Adkins, "The Music Universe is in many ways a much bigger undertaking than *BAM*. *BAM* has a niche as a regional music/lifestyle publication; it serves the local market in Northern and Southern California. The Music Universe, by its very nature, is broader, knows no geographic boundaries. And as such, it's much wider in scope editorially. There's much more we can do with it.

"One of our primary goals is to make sure the service becomes the primary source for industry information and networking."

WHAT'S NEW IN MU

Lorry Fleming, former *BAM* columnist and MU managing editor, explains, "We're trying to create a community for people that work in the music industry, and that's really quite different from what's out on the other services. We're focusing on industry people just as much as we're focusing on fans."

The content areas of Music Universe (hosted by *BAM* editor Steve Stolder, industry veteran Bonnie Simmons, and *BAM* pro audio columnist Ed Tywoniak respectively) are focused on the music press ("Everyone's A Critic"), the music industry ("Backstage Pass"), and pro audio equipment ("Gear Up!"). Each area features a discussion board where the locals can argue the relative merits of their favorite groups, garage bands can get the lowdown on finding a manager and a record deal, and the pros can exchange tech tips. Within each area's software library you'll find everything from GIFs of your favorite artists to MIDI files; additionally, there's information on products from upcoming CDs and videos to musical instruments, and articles and local entertainment listings from around the country.

INTERACTIVE PUBLICATION

For Stolder, who hosts the Music Press area and thinks up diabolically obscure trivia questions, eWorld's interactivity and instant information come as a pleasant surprise: "With hard copy, it's harder to take people's feedback and shape it into something. With this it's much more instantaneous. With a magazine, you get feedback, and you try to translate it and put it into another form. With this, you take feedback and it's part of the form.

"It's a lot more of a give and take. It's not, 'We're telling you a story and giving you our opinion on music—sit back and hear us out.' This is more. We're prompting response by offering opinions and by chronicling what's going on, but at the same time the reader responds much more easily and much quicker."

Adds Adkins, "One of the interesting things online services offer is that they are always publishing. Unlike the print medium, where we have a periodic publishing frequency and a very short shelf life, the online service has a much longer potential shelf life, so it has a greater value as a resource. It's like an archive of information. In some ways it's going to be a more helpful service." ■

BY MARY EISENHART

RESOURCES:

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LorryMU@eWorld.com

Music Press
Steve Stolder
SteveMU@eWorld.com

Music Industry
Bonnie Simmons
BonnieMU@eWorld.com

Music Equipment/ Pro Audio
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MULTIMEDIA 101

Art Teco '94:

Meeting Of The Multimedia Minds

I don't go to many trade shows, conferences, or conventions. I find the signal-to-noise ratio unsatisfactory, dislike the need to enclose myself for several hours in a metal box for transportation just to get to another bigger and noisier box, and generally have more enjoyable things to do with my time.

However, Art Teco '94, the First Annual United Developers Summit, looked as though it might be a cut above the average, with its beautiful Bay-side Fort Mason location and its twin promises to "pioneer a new discussion format that will let attendees interact directly with multimedia industry pioneers" and of—most unbelievable but actually delivered—free beer from the Gordon Biersch microbrewery, provided by—gasp!—Microsoft! I had to check out at least the last of these features.

The unusual nature of the three-day event can be explained by its organizer, *Morph's Outpost on the Digital Frontier*, a monthly magazine for multimedia developers, now entering its second year of publication. Each issue is full of hands-on hints, low-cost solutions, developer profiles, tool and product reviews, and blue-sky prognostications presented in an unpretentious style, sometimes through the irreverent and imaginary figure of Morph. This is definitely not your traditional glossy computer mag. While it includes plenty of technical information, *Morph's* keeps an eye on the quirky artistry and genuine content necessary to make multimedia work culturally, and another eye on the financial and business requirements for commercial success. Even with this serious stuff, *Morph's* motto still seems to be "Toward the fun."

INTERACTIVE TALK

Art Teco's slogan was "The Best of Both Hemispheres," which came to mean parties at night and discussion and exhibits during the day. The daytime program was likewise split between tech talk and wider-ranging cultural conversation.

BY JONATHAN E.

The exhibits were delightfully low key. The hall, on Fort Mason's Herbst Pavilion pier, was naturally lit, and the sound level was pleasant without the angry-insect buzz that infests most large halls with reflected sound. What made this possible, besides the elegance of the surroundings, was that Art Teco did not aim to be the biggest, highest-grossing, lowest-common-denominator show of the year. Its goals were to have a good signal-to-noise ratio, to be of service rather than sell something; an integral part of that strategy was to opt for quality rather than quantity. Yes, folks, small is still beautiful.

In keeping with the Developers Summit aspect of the event, all the exhibitors were professional-level tool and service providers rather than consumer titles. This certainly helped to keep the hype level down, although there still appears to be no end to the profusion and confusion of competing, overlapping, and continual advances that any prospective developer will have to wade through.

This variety of possibilities was also reflected in the panels. Many of the discussion titles were about the same as those you'll see at any trade show; I can't believe everything that could ever be said about these topics hasn't already been said. The theory of such discussions, I suppose, is that you will glean some fresh news from amongst the dross.

The multimedia industry seems to have a peculiar bifurcation between fast-moving technical developments (which are probably better perceived in other forums) and relatively slowly emerging cultural, conceptual, and commercial concerns that may or may not ever become reality, and that we may well be totally bored with by the time they actually do become reality.

In the meantime, endless discussion of these possibilities can be quite fun, and it can be lots of fun to hear two powerful speakers with opposing points of view. It can even be a lot of fun simply to watch a master showman like Marc Canter, one of the "inventors" of multimedia through his development of the original Director application, perform on a panel: he yawns, rubs his eyes, looks thoroughly bored as some audience member stutters through an ill-conceived question, only to pounce with unerring precision on the meat of the matter.

However, I believe that the two main purposes of these events are to allow the players to sniff each other and to attempt to form a consensus about the direction in which all this technology is taking us. The question of whether we should actually bother to develop this technology is not addressed in these circles—the cargo-cult belief in its potential benefits is almost seamless.

This is somewhat ironic, because the issues of what interactivity really "means," what its values are (how quaintly boomer!), what the real economic engine of the digital revolution is, and who has control of it were all raised when discussing this year's hot topic—interactive TV. Out of the panels I attended, Interactive TV: The Developer Market of Tomorrow was clearly the one with the highest anxiety level. Yup, that television market is still figured to be the one that matters, the one with the highest stakes despite all the talk about new media and the end of the mass market!

INTERACTIVE TV

On the one side of the interactive TV debate, there is a camp of idealists who believe that the couch-potato passivity of current television-watching habits and the content of what's shown on TV are destroying the last of America's (and the world's) moral fiber; who passionately believe that somehow we're all ready to educate ourselves and to get up and communicate with each other through that familiar-looking box. On the other side are the marketeers, who figure that with the size of the total market getting larger and the number of niche markets proliferating, something like interactive TV is just the way to keep the advertising industry healthy and reach consumers in ever more efficient ways.

> The audience applauded loudly when it was suggested that the crucial task before us is breaking out of the TV and CD-ROM models of interactivity.

So you can guess that the idealists on the panel and in the audience fretted that the purported five hundred channels of tomorrow are nothing more than a design for selling us stuff, with a large downstream pipe into the home and only a tiny upstream pipe out, with significant limitations on interactivity. The audience applauded loudly when it was suggested that the crucial task before us is breaking out of the TV and CD-ROM models of interactivity. This is the sentiment you run into again and again wherever net.heads are gathered and interacting.

Actual news on interac-

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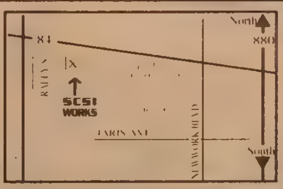

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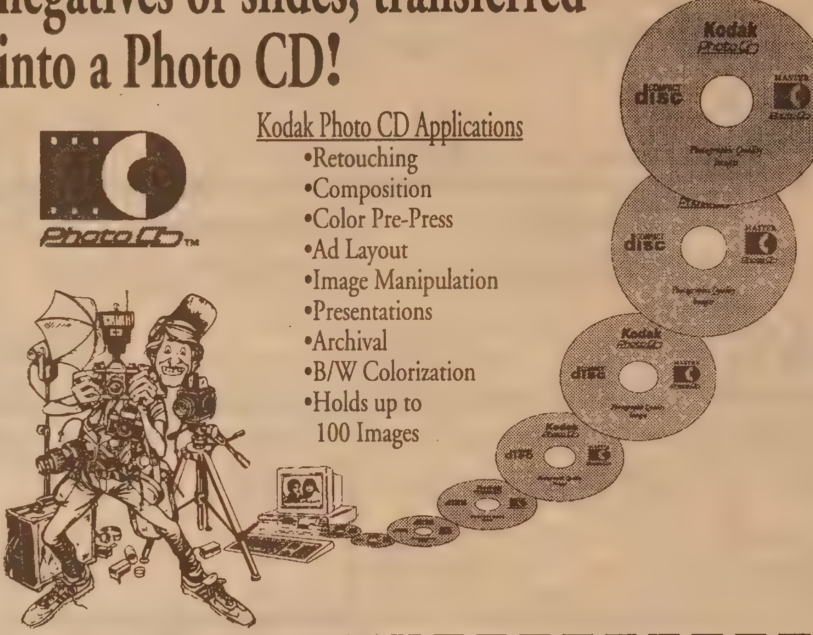

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Tell Them You saw it in MICROTIMES

tive TV, however, is extremely slow in coming. As Philip Elmer-Dewitt reported in the May 23 issue of *Time*, current capabilities lag far behind earlier speculative projections. It seems that what engineers can deliver is nowhere near even relatively simple interactivity. Canter summed it up by saying that he was "frustrated with the hardware"; the consensus was that interactive TV "is a developer's nightmare."

Any sort of standards in this area appear to be at least three years in the future, while one panel member, Graeme Devine of Trilobyte, suggested waiting five years. What is needed for those who want to get a head start on producing content is "middleware," that is software that will allow you to translate whatever it is you have in whatever format to whatever format eventually is decided upon. In the meantime, if you just *must* scratch that content itch, the best advice is to keep it simple.

Canter hit the nail on the head when he said that "there'll be no context for standards until we've made mistakes." He figures that meaningful standards will emerge around the third generation of technology. At the consumer level, it was agreed that there'll always be different systems used to access the content, and so the search for a single $300 set-top box is something of a red herring. The idea of such a panacea gave the panel a good laugh.

At this time, interactive TV has not even had any rigorous field testing, and so there is absolutely no blueprint to follow. It seems certain, however, that one day a technology that permits some sort of two-way consumer video communication will be commonplace. Lesley Czechowicz, a consultant to Fujitsu and a panel member, pointed out that the growth in numbers of telecommuting home workers desiring remote video connections will provide a ready market beyond simple entertainment, and that this factor will encourage the broadband infrastructure out of the house necessary for genuine interactivity.

The viewing habits of the young are further evidence that there will be a core market in the future. While a ten-year-old's idea of fun in the past was to go to a movie theatre, today it's to play video games. Picture-in-picture viewing to keep an eye on a ball game while watching cartoons is a current option. As Douglas Rushkoff, moderator of the later Computers as Culture panel and author of *Cyberia* (HarperSanFrancisco, 1994), has observed, the crucial difference between generations these days is that the younger generation expects to be able to control what's onscreen to a much greater extent than simple channel-surfing. Doug Millison, editor-in-chief of *Morph's* and moderator of the discussion, has put his finger on this pulse and identified these active young viewers as "screenagers." If these observations are correct and these mess-with-it attitudes do not diminish into old-fashioned linearity with the aging process, there will be a radically different atmosphere toward television in the future, and a new market will be born.

The struggle between the PC-centric model of mass net.conversations and the TV model of broadcast is going to be a long, and, I suspect, inconclusive one. As Millison pointed out, both models work, and, as I've previously mentioned in this column, new media will not supplant the old but will augment them.

The plans for content are so far pretty pedestrian. Movies-on-demand is the first thing almost everyone thinks of. Home shopping is close behind, followed by time-shifting of programming, and then choosing your camera angle at sporting events or following a particular golfer. These obvious choices are only the first step of overlaying present material with some minimal interactivity.

It was generally acknowledged that it will be very hard to create

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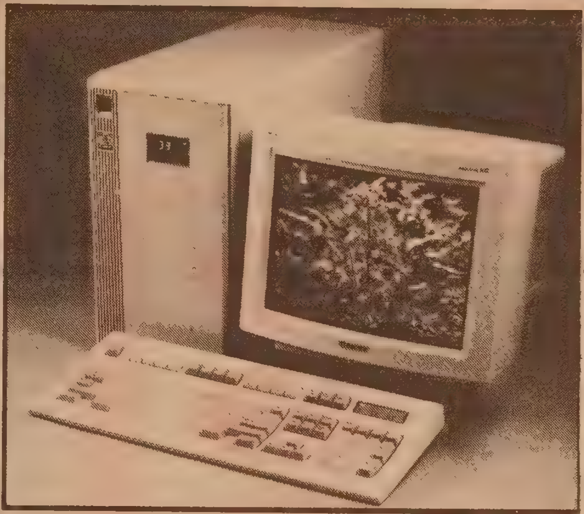

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meaningful interactive content. Perhaps some of those screenagers will come up with something stronger than those options to make this medium work. Canter suggested that everyone read Neal Stephenson's *Snow Crash* (Bantam, 1992) and pay special attention to The Black Sun in the Metaverse scenario to get an idea of what intrigues him.

How to get paid for producing these goodies was, of course, the question that some in the audience were most interested in. In the long run, this means "how does the consumer contribute toward the cost?" Millison noted that TV is already frequently paid for directly by the consumer through cable, although advertising covers almost all the cost of network broadcasting. Early trials are testing the three basic models that present transaction mechanisms can support: subscription, transaction (i.e. pay per view), and advertising supported. Future scenarios range from the extremes of paying people to watch the ads to calculating royalties for the content producers from information in the headers of each data packet as it zooms from server to subscriber.

COMPUTERS AS CULTURE

The interactive TV discussion was mostly folks of some considerable experience talking about what will be handed down from the corporate heights to younger generations. These were pretty hip people and clearly had some innovative thinking between them. Yet beneath the beneficent talk, I detected a certain business-as-it-has-always-been-done attitude, a subtle sort of top-down direction of culture, content, and technology with the ultimate purpose of multiplying the almighty dollar.

I was amused by the contrast with the Computers as Culture panel, which was composed of people who are now actually a little too old for the screenager tag but who basically grew up with computers. What I sensed from this discussion was something close to a "thank you, but we'll do it for ourselves." It was almost as though the whole concept of interactive TV is wrong, a "you just don't get it" situation that may yet upset the corporate applecart. It's a mindset that completely rejects all the dummying down and diversion of creativity associated with turning computers into televisions.

This was best hinted at by Andrew Mayer of Shattered Silicon's brushing off a question about graphic interface design with what amounted to "Who cares? Menus and command lines work fine." They do, and what this panel presented was the view that computers are a new factor in society and that old models just will not work in projecting their effects.

Next year, I'll attend Art Teco to check out more than the beer; the juxtaposition between these two approaches should lead to a ferment of its own. ■

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Gulch Gossip

By Jonathan E.

By the time you read this, **Starr Sutherland** will no longer be an SF resident—but, before he left town, his video post-production company, **Independent Programming Associates** (IPA), won the first Clio Award ever for multimedia advertising. Sutherland is characteristically modest about the award, portraying the CD-ROM as little more than a self-advertising Christmas card containing IPA's demo reels, rate sheets, and other company info. The CD-ROM was actually put together by **Lance Ford Jones**, who heads up IPA's new Intermedia section. In the future, IPA will develop CD-ROMs for the consumer market; an art history project with the **Ant Farm** of Cadillac Ranch fame is underway. Why is Sutherland no longer an SF resident? Because he is accompanying his beloved, the delightful **Natasha V.**, once A&R director for **Sandy Pearlman's Popular Metaphysics Records** and first US representative for **Lights in a Fat City** (now mutated into **Trance Mission**), to New York where she is pursuing graduate studies in film at Columbia.

▼ ▼ ▼ ▼ ▼

Ken Coupland, contributing editor to ***OnLine Design***, bon vivant, wordsmith, and all-round acerbic commentator on multimedia and contemporary life, just signed a contract with **Ziff Davis Press** for his first "own-name" book. The working title is ***Multimedia Now! The Art of Interactive Design***. Coupland promises that it'll be all about "the far out, brand new stuff—the weird and idiosyncratic titles from people nobody's heard of yet that really begin to realize the potential of the technology." He's a big advocate of using multimedia as a means of personal expression and believes that "when you committee this stuff, you end up with Alpo." A current CD-ROM title high in Coupland's regard is **Bill Barminski's** Consumer Product, which he describes as "wicked, funny, and highly creative." If you think your title is tough enough to stand up to Coupland's withering eye, let him know about it at (510)547-8625.

▼ ▼ ▼ ▼ ▼

Candice Pacheco of **D'Cückoo** wrote the music for Quantum Gate 2, the new interactive movie by **Greg Roach** of **Hyperbole Studios**, widely considered to be one of the leaders in the field. The music will also be released in September as a regular audio CD through **RGB Records**, a subsidiary of **Hearts of Space**. Meanwhile, D'Cückoo are off to Florida to play a SIGGRAPH party at Disney World, sponsored by SoftImage, SGI, and Disney.

▼ ▼ ▼ ▼ ▼

BAM, our sister (mother?) magazine, enters the world of electronic multimedia with the launch of the **Music Universe** on **Apple's eWorld** online system. **Lorry Fleming**, previously with **Alias Records** and ***Whole Earth Review***, is the overall managing editor of the enterprise with the goal of "creating a community place for both music fans and the industry." There are three main areas in the Universe. The Backstage Pass area is organized by **Bonnie Simmons**, known to almost everyone in the music business for her years and years of work in more facets of the industry than I can enumerate here. This is where bands can look for managers or A&R people, A&R people can look for bands, and fans can check for news of tours and fresh releases. Everyone's A Critic is for music journalism, including material from *BAM* and other sources and responses to that material. **Steve Stolder** and **Alexandra Haslam**, editor and assistant editor of *BAM* respectively, are running this area, and my own One World Beat column will appear there. Lastly, there's the Gear Up! area for "all things gear," put together by **Ed Tywoniak**, featuring news and help for producers, engineers, and musicians. There will be actual paid advertising by sound equipment companies in this section. It will appear in special folders, the user will have to look for it—it's not like the scatter-shot broadcast junk mail that upsets so many net users. On the multimedia front, the first implementation (besides graphics) will be excerpts from worthy demo tapes for users to check out. For further info on eWorld, contact Apple at 1-800-775-4556.

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Unconfirmed rumors (or the phone calls were not returned by press time—but the sources are good!): **Hummer Winblad** put up one million dollars in venture capital for **Pop Rocket** to market and promote the totally boffo Total Distortion, a title that shouldn't need any marketing or promotion given its awesome wonderfulness. The new **Electronic Arts** catalog claims that the Mac version of Total Distortion is now available—attentive readers may recall that Pop Rocket pulled an April Fools Day stunt on me by claiming that it would be finished by then. No one was fooled, were they? ... **Jim Ludtke** is working on a follow-up title to Freak Show for **The Residents**. This is hard to believe, but it's reportedly called "A Bad Day at the Midway"—I'm shuddering already at the thought of what this may entail. The advance is rumored to be $400,000—enough for a few carnival rides.

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Tech news: **Macromedia** has managed to get Director files to play on a 3DO machine—now we're talking convergence!

▼ ▼ ▼ ▼ ▼

Surprisingly enough I make very little of this material up; people actually tell me this stuff! If you've got news about your own or someone else's project that you think deserves a wider audience, email me at jeve@well.sf.ca.us or, if you like answering machines, call me at (510)236-8453. Scurrilous stories are especially welcome, but will be checked out and, if possible, experienced firsthand; sorry, but press releases don't count (they're sooooo bloody boring!). ■

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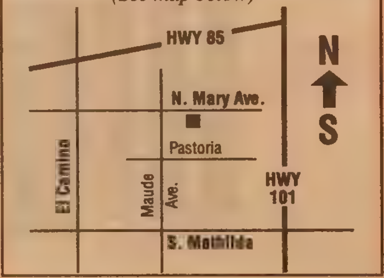

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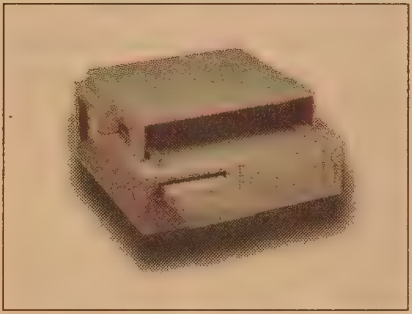

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Whether you call it the information super-"highway," "hypeway," or "tollway," one thing is clear, people will continue to demand more information. People also want real-time updates and instant access. Only a few years ago, you couldn't even get twenty-four-hour checking account information using the telephone; today I've often lamented the fact that the database was only updated daily. It's just human nature: yesterday's accomplishments become today's standards, and tomorrow we want more. This growing need for immediate information will be a driving force behind the information revolution.

SCALA INFOCHANNEL

Scala has recognized the advantages of the TV medium for providing information. Nearly everyone on this planet knows what a TV is. Its impact on the cultures of the world cannot be disputed. People will effortlessly watch TV with little coaxing, and the medium is one of the cheapest ways to distribute information to masses of people. The real hurdle with TV is not the medium itself but with program production.

Scala has been overcoming this problem for some time with a product called InfoChannel, a computer-based information system. This product provides an easy way to create, schedule, and distribute information to one or even thousands of remote sites. The information can be displayed using standard TV sets or computer monitors.

THE SOFTWARE

InfoChannel shares basically the same interface and presentation power as its cousin, Scala Multimedia 300. The main differences are InfoChannel's scheduling and networking features, and its ability to update a presentation while it continues to run. Using Scala Multimedia 300, you would have to stop the presentation, make the changes, and then restart it.

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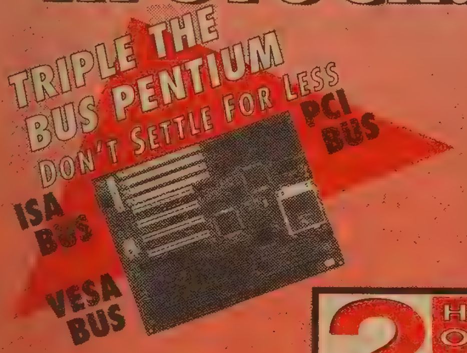

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A schedule can be set for groups or individual pages so that they are displayed at a certain time. Dates and days of the week can also be specified. This is particularly useful to prevent outdated advertisements and promotions from being displayed.

InfoChannel is also capable of controlling many devices, like VCRs, DATs, laserdiscs, MIDI, and the VideoToaster—now that's real multimedia.

NEW VERSION

The newest version of InfoChannel adds MPEG support using an optional MPEG decoder board. Software-based MPEG encoding has also been announced. Other new features include built-in advertiser billing, better image manipulation tools, framegrabber support, and outline text capability.

STATIONS

An InfoChannel "Master Station" is basically an Amiga running the InfoChannel software. It is on this machine that all of the text, graphics, animations, and audio are compiled into a presentation.

A "Player Station" is an individual Amiga computer with InfoChannel player-only software. The Master Station coordinates and controls the distribution of InfoChannel presentations to the Player Stations. The InfoChannel's ScalaNet module handles maintenance, configuration, and supervision of the Player Stations. It also controls password protection, author privileges, statistics collection, and other administrative tasks.

In the simplest implementation, a Master Station is used with a single Player Station connected to a network of TVs. A classic example of this would be a cable TV broadcast of a programming schedule, or in a closed-circuit situation. There is no interactivity here and all of the TVs would simultaneously display the same information. A hotel might also implement such a system to display an event schedule.

Since the Player Stations are independent machines, they can individually interact with users. As a result, multiple players can provide different information depending on the needs of the user. You can also have multiple Master Stations that transmit data to a group of players. Each player can individually merge the received data. InfoChannel can also accept data from mainframes, minis, and PC networks and integrate it into a presentation.

TRANSMISSION

If there is only one Player Station and the Master Station is not located too far away, the two computers can be linked using an inexpensive null modem cable. An Ethernet-based Novell or TCP/IP local area network can also be used to distribute the presentation. An easy way to distribute presentations over long distances is using standard telephone lines and modems. ISDN (Integrated Services Digital Network) lines, satellite, and broadcast technology are also supported.

CHANNEL 4000

Channel 4000 interviewed key people in the Amiga community and gave subscribers invaluable guidance on what they should be doing to protect their desktop video businesses.

The Master Station will automatically compare the Master and Player stations and not transmit duplicate data. If there is a time-charge imposed on the transmission, like telephone charges, this feature can be a real money saver. This is especially true if text is usually the only thing updated on a regular basis. Larger files like animations and other graphics can be preinstalled using floppy disks.

REAL LIFE USES

Scala boasts a large number of InfoChannel installations throughout the world—Hilton, Sheraton, Marriott, Ford, March Air Force Base, GM, Nissan, JC Penney, American Airlines, Boston University, and Shell Oil. The number of hotel installations is impressive. Most of the systems are in Europe, but there are several in the US.

A healthcare provider in Virginia uses interactive InfoChannel kiosks in their hospital lobbies. The system provides patients and visitors twenty-four-hour access to all types of graphic and printed information, including detailed direction information.

The SAS Scandinavia Hotel in Oslo, Norway, uses InfoChannel for its five hundred-room hotel. InfoChannel provides information on restaurants, bars, the pool and sauna, TV schedule, laundry services, and other hotel services. Information is updated several times a week, and management loves the ability to make changes in a matter of seconds.

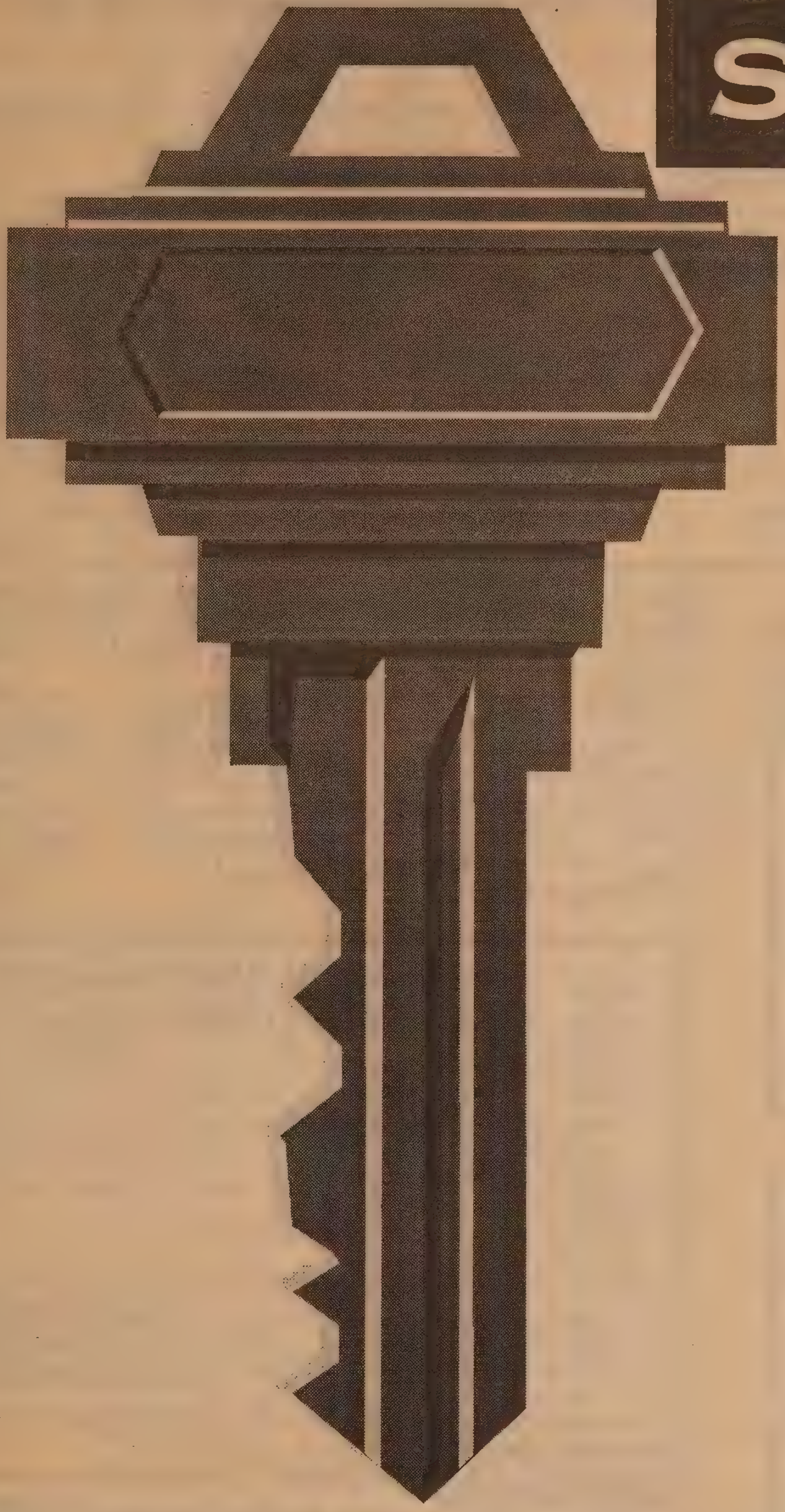
A cable company in Michigan serving forty thousand households uses several Player Stations. Each player provides programming for a particular local network. Programming includes information from the public library, local government, and schools.

In England, a supermarket chain has an interactive electronic cookbook kiosk. Using a touch screen, customers can view recipe suggestions and also get printouts and coupons. In Holland, one of the largest Dutch banks, VSB Bank, also uses a touch screen InfoChannel system to provide individual information on deposits, loans, insurance, and real estate. A second InfoChannel broadcast displays general bank information.

CHANNEL 4000

A cutting edge implementation of InfoChannel is "Channel 4000" created by Alpha Video, located in Minnesota. Along with a silent partner, Alpha Video is owned by two former NewTek sales managers, Reid and George Johnson (no relation). In the past three years, the revenues for the desktop video dealer have grown from $4.5 million to $9 million in annual revenue.

Continued on page 266



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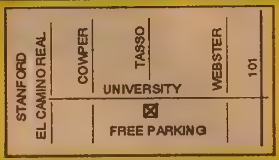

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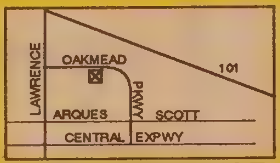

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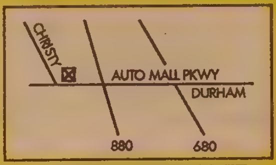

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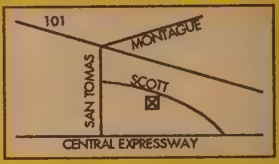

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Enterprise IV	33/66	256KB	223.55	29.5	144.5	48.7
Enterprise IV	50	256KB	167.64	22.3	108.4	37.0
Enterprise IV	40	256KB	134.13	17.3	86.6	22.4
Enterprise IV	33	256KB	111.75	14.9	72.2	24.3
SprVoy VLB II	33/66	256KB	223.53	29.1	144.5	48.4
SprVoy VLB II	50	256KB	167.64	22.1	108.4	36.8
SprVoy VLB II	40	256KB	134.2	17.8	86.6	25.9
SprVoy VLB II	33	256KB	111.76	14.8	72.2	24.3

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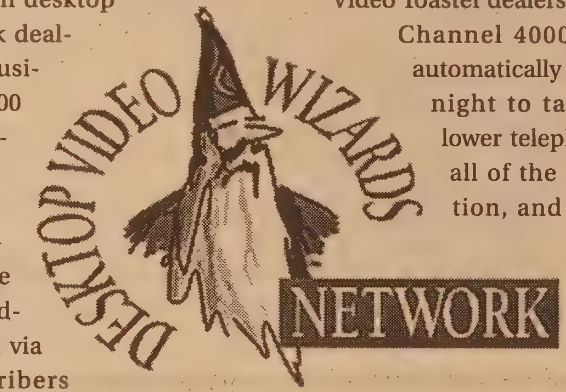
Continued from page 262

Former NewTek VP Paul Montgomery called Alpha Video "the world's best desktop video dealer."

In an effort to capitalize on Alpha Video's expertise in desktop video and network dealers with similar businesses, Channel 4000 was born. It is promoted as the world's first private desktop video television channel. The InfoChannel broadcast is transmitted via modem to subscribers five days a week, and each broadcast runs about fifteen minutes. Each subscriber has its own Player Station.



Though the service, which began in September 1993, started out heavily Toaster-oriented, changes in the industry—most notably Commodore's bankruptcy—have caused Channel 4000 to cover more and more non-Amiga-based products. The main subscriber base is referred to as the "DeskTop Video Wizards Network." For the most part, these are Video Toaster dealers.

Channel 4000 broadcasts are automatically transmitted late at night to take advantage of lower telephone rates. Nearly all of the graphics, animation, and audio are preinstalled on the remote Player Stations, so the broadcast usually consists of only a small player script file that can be transmitted in less than a minute.

THE BROADCAST

From the broadcast menu a subscriber can choose any one of the five most recent broadcasts. The entire broadcast is complemented with catchy background music. Every broadcast is divided into various segments that more or less cover a certain topic. Limited advertising time is available during the broadcasts. However, to date, there has been little advertiser support.

Alpha Video has created custom backgrounds to give the broadcast its own unique look and feel. The backgrounds provide an exciting yet comfortable backdrop for the informative text that is tastefully wiped in. Large legible fonts are used and the music enhances reading the text.

Channel 4000's aim is to keep its subscribers up to date and informed on a daily basis. If you consider that traditional printed materials like magazines and company flyers are out of date by weeks or months by the time they are received, Channel 4000 is providing essentially real-time news.

Coverage of the current uncertainty surrounding the Amiga with Commodore's unknown future has demonstrated the value of Channel 4000's up-to-the-minute infor-

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II.	Microsoft OEM Benefits	By: Mr. John Wang & Ms. Anne Murphy
III.	Taiwan New Power PC Consortium	By: Mr. Chi-Yuan Chin
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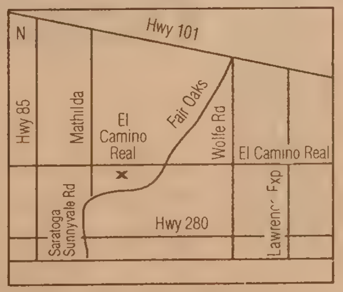

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mation. Since the day the infamous *Wall Street Journal* article hit, they have been doing their best to wade through the rumors and sort between fact and fiction. Their telephone interview with one of the bankruptcy trustees—before anyone even knew who they were—was unprecedented. They have interviewed other key people in the Amiga community and given subscribers invaluable guidance on what they should be doing to protect their desktop video businesses.

Channel 4000 subscription rates range from $50 to $350 a month, depending on the annual revenue of the subscriber. Alpha Video sells and leases Player Stations. You can use your own A1200 or A4000 (AGA required), provided you have enough free disk space and a supported modem. However, you are a lot less likely to encounter transmission problems with a dedicated machine.

Implementations of InfoChannel like Channel 4000 are providing a glimpse of things to come. It's easy to generalize about the information superhighway and how long it will take to pave. The fact of the matter is: the pioneering efforts of companies like Alpha Video demonstrate that the technology is already here today.

LATE NEWS

Just as I was about to put this article to bed, I received the sad news that the plug was being pulled on Channel 4000. Alpha Video was unable to expand the Channel 4000 subscriber base beyond Amiga/Video Toaster dealers. They needed strong advertiser support that could not come from Amiga developers alone; without a PC-based InfoChannel and no supply of Amiga 1200s, they could not offer an affordable player system. (On a somewhat related note, there is an interesting rumor that a shipment of newly manufactured 1200s has appeared in Europe.)

George Johnson stated that "ending Channel 4000 is not an issue of us giving up on this. We're even more excited about this than ever. We think there is a ton of other applications. We learned a lot from Channel 4000 and we're just going to keep going with this thing."

Resources are now being focused on Alpha Video's Private Channels division to promote their Custom Channel and Alphachannel products. With Custom Channel, they will produce and distribute a daily InfoChannel broadcast for clients—essentially a customized Channel 4000. Their Alphachannel product is geared toward a cable/broadcast station or closed-circuit situation. This can be an interactive application where viewers can affect what's being shown using their telephone. The interaction can be real-time or queued. If they want to, clients can take a totally hands-off approach and merely provide raw information to Private Channels and let them take it from there.

Private Channels has already been contracted to do several InfoChannel-based installations, including one for Scala dealers. Another client is a tire installation chain that will show an advertiser-sponsored informational broadcast to people in their waiting rooms. Pinnacle was very interested in a custom channel to promote their product Aladdin, a PC-based video switcher. However, they didn't like the fact that Channel 4000 only ran on an Amiga.

Incidentally, Scala has hired a number of ex-Commodore employees, many of whom were involved with Amiga research and development. It is well known that Scala is desperately searching for a way to effectively port Scala Multimedia and InfoChannel over to the PC platform. The problem? Windows can't handle it. I suspect that they are using the former Commodore brain power to design software and perhaps even hardware to run Scala products on IBM PC hardware, with Amiga or better performance. ■

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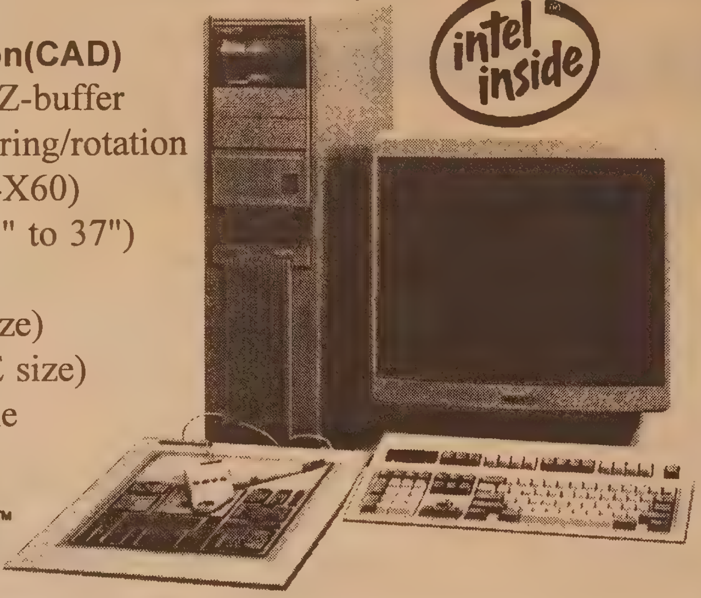

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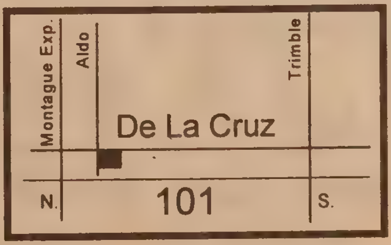

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14" (1024 x 768) .28 interlaced	$208
14" (1024 x 768) .28 Non-interlaced	$218

Acer

14" ACER 34T (1024 x 768) .28 NI	$248
Other	$Call

ViewSonic

14" ViewSonic 6E (1024 x 768) .28 NI	$273
15" ViewSonic 15EX (1024 x 768) .28 NI 76Hz	$368
17" ViewSonic 17G	$738
17" ViewSonic 17	$923
21" ViewSonic 21	$1728

ADI

14" ADI 3G (1280 x 1024) .28 NI	$288
15" ADI 4G (1280 x 1024) .28 NI 72Hz	$368
17" ADI 5A (1280 x 1024) .26 NI (Low Radiation)	$698

SAMPO

15" Sampo (1280 x 1024) .28 NI	$348

Sony

15" 15SF (1280 x 1024) Non-Interlaced	$438
17" 17SE (1600 x 1200) Non-Interlaced	$1048

NANAO

17" Nanao F550iw (1280 x 1024) .28 NI	$928
Other	$Call

INTERFACE CARDS

(Generic)

IDE 2HD & 2FD 2s, 1p, 1g	$13
IDE 2HD & 4FD	$15
IDE PCI 2HD	$25
IDE 2HD & 2FD 2s (16,550 UART), 1p, 1g	$38
IDE VLB 2HD & 2FD 2s, 1p, 1g	$16
IDE VLB 4HD & 4FD 2s (16,550 UART), 1p, 1g	$45

DTC

2278 IDE VLB 2HD & 2FD 2s, 1p, 1g	$19.95
3270 SCSI VLB 7SCSI & 2FD	$109.95
2277 IDE VLB Caching (0-16Mb)	$119.95
3290 EISA SCSI (0-4Mb)	$249.95

Adaptec

1542C w/o Kit or w/ Kit	$162 / $235
2842 VL Fast SCSI-II VESA w/ Kit	$235
2940 PCI SCSI-2 w/ kit	$198
2742T Single w/o Kit	$185
2742W Fast Wide SCSI EISA w/ Kit	$385

Promise Technology

DC-420 IDE VLB 2HD & 2FD w/ 512KB 2s, 1p, 1g	$98
DC-4030 IDE VLB 4HD & 2FD (0--->16MB)	$98

Buslogic

BT-445s VLB SCSI-II 7SCSI & 2FD	$198
BT-946C PCI SCSI-2 7SCSI	$245

AIR

QAcess IDE & SCSI	$118

HARD DISK

Western Digital

340MB IDE 13ms (WD-2340)	$228
420MB IDE 12ms (WD-2420)	$238
540MB IDE 12ms (WD-2540)	$328
700Mb IDE	$Coming Soon
1.0GB IDE	$Coming Soon

Conner

213MB IDE 14ms (CFS210A)	$168
340MB IDE 13ms (CFA340A)	$218
420MB IDE 12ms (CFS420A)	$228
540MB IDE 12ms (CFA540A)	$308
810MB IDE 10.5ms (CFA810A)	$568
1.0GB SCSI 10.5ms (CFA1060S)	$668
Other	$Call

Maxtor

345MB IDE 14ms (7345A)	$218
540MB IDE 12ms (MXT-7546A)	$298
540MB IDE 8.5ms (MXT-540A)	$338
340MB SCSI 14ms (7345S)	$268
540MB SCSI 8.5ms (MXT-540S)	$418
1.2GB SCSI-2 8.5ms (MXT-1240S)	$888
Other	$Call

Quantum

540MB IDE 12ms (LPS540AT)	$338
540MB SCSI 12ms (LPS540s)	$388
1.0GB SCSI-2 9.5ms (PD1080s)	$688
1.8GB SCSI-2 10ms (PD1800s)	$1018
2.1GB SCSI-2 9ms (E2100s)	$1388
Other	$Call

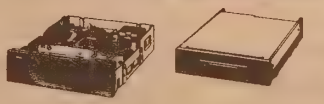
Seagate

1.0GB SCSI-2 10ms (ST31200N)	$688
1.7GB SCSI-2 9ms (ST11900N)	$1078
2.1GB SCSI-2 9ms (ST12400N)	$1418

Micropolis

1.0GB IDE 10ms (MC2210A)	$698
1.75GB IDE 10ms (MC2217A)	$918
1.05GB SCSI-2 8.5ms (MC4110)	$658
1.75GB SCSI-2 10ms (MC2217)	$888
2.0GB SCSI-2 11ms (MC1926)	$1388
3.0GB SCSI-2 11ms (MC1936)	$2088

FLOPPY DRIVE



1.44Mb or 1.2Mb (TEAC)	$36 / $45
1.44Mb or 1.2Mb Black (TEAC)	$39 /$49
1.2MB & 1.44MB Combo (EPSON)	$83
1.2MB & 1.44MB Combo (TEAC)	$99

CD-ROM DRIVE

Mitsumi Double Speed 250ms w/ controller	$129
Sony 33A w/ controller (MediaMagic Package)	$138
Panasonic Double Speed 310ms	$135
Toshiba Double Speed SCSI 200ms (XM-3401B)	$268
NEC Triple Speed SCSI 190ms (510)	$348
NEC 3XI Triple Speed SCSI 190ms	$418

KEYBOARD

Mitsumi 101 Enhanced Keys	$15
Qtronic 101 Enhanced Keys (Black)	$18
Keytronic 101 Enhanced Keys	$28
NMB 101 Enhanced Keys Click	$45
Focus 2001 101 Enhanced Keys	$35
Focus P9000 Click w/ Calculator	$55
101 Enhanced Keys w/ TrackBall Built-in	$55

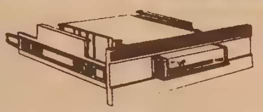
MODEMS

Modem 2400 & Fax 9600	$33
Modem 14,400 & Fax 14,400	$68
US Robotic Modem 14,400 & Fax 14,400 Internal.	$108
US Robotic Modem 14,400 & Fax 14,400 External	$125
Intel Modem 14,400 & Fax 14,400 Internal	$118
SupraExpress Modem & Fax 14,400 00 Internal	$78
Supra Modem 28,800 & Fax 14,00 Internal	$Call

MICE

3-Buttons Serial	$7.98
Logitech 2 Buttons Serial	$14.95
Logitech Dexxa Serial	$17.95
Logitech First Serial	$28.95
Logitech Mouse Man Serial	$24.95
Logitech Mouse Man Bus	$44.95
Logitech Portable Serial	$44.95
Microsoft Serial Mouse (Ergonomic)	$22.95
Microsoft Bus Mouse (Ergonomic)	$59.95

ACCESSORIES



Conner 250Mb Tape Back-up (Retail Box)	$139.95
Colorado 250Mb Tape Back-up (Retail Box)	$159.95
CD-Caddy	$3.98
CPU Cooling kit w/ heatsink & fan	$6.98
CPU Cooling Kit w/ heatsink & fan (Pentium)	$13.95
Power Center (Surge Protector)	$14.95
Speakers 5 Watts	$7
Speakers 25 Watts	$19
Speakers 80 Watts	$55
MS-DOS 6.22 (OEM)	$35
MS-DOS Windows 3.11 (OEM)	$45
All Cables or Gender Changer	$20% off
All HP Cartriges	$20% off

Sound Card

Sound Blaster Pro Value Edition	$74.95
Sound Blaster 16 Basic Value Edition	$99.95
Sound Blaster 16 MCD	$135.95
Sound Blaster 16 MCD w/ ASP	$165.95
Sound Blaster 16 SCSI-II	$139.95
Sound Blaster 16 SCSI-II w/ ASP	$195.95
Sound Blaster AWE 32	$269.95
Game Blaster CD 16 (Package)	$365.95

MEMORY

1 x 9 -70ns (3-chips)	$35.95
1 x 3 -70ns (9-chips)	$37.95
4 x 9 -70ns	$137.95
4 x 9 -60ns	$145.95
1 x 36 -80ns (4Mb)	$139.95
1 x 36 -70ns (4Mb)	$149.95
2 x 36 -70ns (8Mb)	$299.95
2 x 36 -60ns (8Mb)	$315.95
4 x 36 -70ns (16Mb)	$578.95
4 x 36 -60ns (16Mb)	$Call

Resources

Calendar Of Events

Conferences, Shows, Special Events

July

July 25–27 IC Card Expo. Santa Clara Convention Center. IC Card Systems & Design. Call: 1-800-828-0420.

July 25-29 Object World San Francisco Conference and Exposition. San Francisco. IDG World Expo and Object Management Group. Call: Lynn Fullerton or Susan Granata, 1-800-225-4698.

July 26–August 7 An Object Orientation Play. Cowell Theater, Ft. Mason, San Francisco. Modus Ensemble. Call: City Box Office, (415)392-4400.

July 27–29 1994 Silicon Valley Personal Computer Design Conference And Exhibition. San Jose. SysTech Research. Call: Ken Majithia, (408)293-8383.

July 30–31 Computer Show And Sale. Santa Clara Convention Center. MarketPro. Call: (415)456-6730.

July 31–August 2 ParcPlace International Users Conference. Santa Clara. ParcPlace Systems, Inc. Call: (408)481-9090.

August

August 1 Deadline For Submissions: Second Annual Autodesk International Image And Animation Contest. Autodesk, Inc. Call: (707)794-1444 or 1-800-964-6462, ext. 909.

August 1–3 1994 USENIX Symposium On High-Speed Networking. Claremont Hotel, Berkeley. USENIX Association. Call: (510)528-8649.

August 1–5 TOOLS USA Conference. Santa Barbara. Smith and Smith. Call: (805)685-1006.

August 6–7 Computer Show And Sale. San Francisco Fashion Center. MarketPro. Call: (415)456-6730.

JULY 27–29

SILICON VALLEY PERSONAL COMPUTER DESIGN CONFERENCE AND EXPO

HYATT HOTEL, SAN JOSE

The Silicon Valley Personal Computer Design Conference and Exposition will feature three days of in-depth technical presentations on multimedia subsystems design, low-power/portable systems design, and high-performance systems design. The speakers will be from Intel, IBM, Motorola, AT&T, National Semiconductor, and other major players. One-day registrations are $295, and all three days cost $550; admission to the exhibits only is $25. Call SysTech Research at (408)293-8383.

SEPTEMBER 23–OCTOBER 5

HIGH-TECH TRADE AND INVESTMENT MISSION TO MALAYSIA AND THAILAND

The US Department of Commerce and the California-Southeast Asia Business Council (Cal-SEA) are organizing a high-tech business mission to Malaysia and Thailand. Its purpose is to explore opportunities for US companies in telecommunications, computers, software, networking, semiconductors, electronics, medical instrumentation, and related infrastructure needs in these rapidly growing markets/industrial centers. Participation is limited to fifteen US companies, and a $1000 deposit per participant is due to Cal-SEA by July 31. The total cost will be approximately $5100 per person. For more information, contact Raj Shea, USDOC, (408)970-4615; or Amy Hanson, Cal-SEA, (510)536-1967.

NOTICE

Because of the plethora of listings received and the limited space available, we are not able to list every class offered by every educator. We try to give a representative sample when we can't fit all of a company's offerings, but please call the organizations for complete information on their classes or to receive a course catalog.

August 7 Computer, Ham Radio, Electronics Swap Meet. Las Positas College, Livermore. Livermore Amateur Radio Club. Call: (510)447-3857.

August 7–12 GroupWare '94: The Workgroup Solutions Conference And Expo. San Jose Convention Center. The Conference Group. Call: 1-800-247-0262.

August 13 Computer Show And Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)456-6730.

August 13–14 Hackers On Planet Earth, The First US Hacker Congress. New York City. H.O.P.E. Call: (516)751-2600.

August 14–19 SCO Forum '94. Santa Cruz. Smith and Smith. Call: (805)553-9939.

August 17–20 Fifth Annual Macintosh Summit Conference. UC Santa Barbara. UCSB Extension. Call: (805)893-4588.

August 17–21 ONE BBSCON. Atlanta, GA. ONE, Inc. Call: (303)693-5253.

August 21 Computer Show And Sale. Scottish Rite Center, Sacramento. MarketPro. Call: (415)456-6730.

August 27 Computer Show And Sale. Solano County Fairgrounds, Vallejo. MarketPro. Call: (415)456-6730.

August 28 Computer Show And Sale. Marin Civic Center, San Rafael. MarketPro. Call: (415)456-6730.

September

September 7–9 Windows Solutions 94 Conference And Expo. San Francisco. ZD Expos. Call: 1-800-488-2883 or (415)578-6900.

September 13–15 Online Developers Conference. San Francisco. Jupiter Communications. Call: (212)941-9252.

September 13–16. Seybold Conference. San Francisco. Smith and Smith. Call: (310)457-8500.

September 14–16 COMPUEXPO '94. San Jose Convention Center, San Jose. Miller Freeman, Inc. Call: FS Communications, (415)691-1488.

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64-BIT INTEL PENTIUM Local Bus Notebook

200% Faster than 486DX2-66 & 500% Faster for Math intensive applications!

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- **Built-in audio** chip, Microphone & Speaker (**Record, compress, store and playback voice, sound & music to disk).** Sound Blaster & Windows Sound Sytem compatible
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- **Removable Hard Drive** 250MB (340, 540 Optional)
- **8MB RAM** (User upgradeable to 16,24,**40MB**)
- **PCMCIA** one **Type III** & one **Type II**
- 1.44 MB Floppy Drive
- Dual Scan/Active Color Display (supports 1024x768 256 colors on ext. Monitor)
- Extra large Built-in 25mm front-center Trackball
- **46 Watt** High Capacity **Ni-MH Battery**, Quick Charge 2 hr
- Ports for high-speed serial, enhanced parallel, keyboard, monitor & **VLB Docking Station**
- Deluxe Carrying Case & AC adapter

8MB RAM Included

Dual Scan Color 60/66MHz..$3275/3375
Active Color 60/66MHz.......$4275/4375
VLB Docking Station $475

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LOCAL BUS IDE

Model 7500

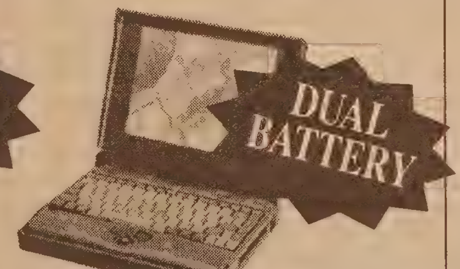
- 486-33 MHz CPU (Upgradeable to DX4-100)
- **8/16K Cache** (Built-in)
- Built-in Audio, **MIC, Speaker, Sound Blaster & Windows compatible**
- **32-bit VESA Local Bus Video & IDE**
- **1MB Video RAM** with **Win Accelerator**
- **PCMCIA III** or 2 IIs
- **4**MB RAM (exp. to 8/12/20/**36MB**)
- 1.44MB Floppy Drive
- **32-bit Removable 250MB** Hard Drive (340MB/540MB Optional)
- Built-in **front-center 19mm Trackball**
- **Ni-MH battery**, Quick Charge 2hrs.
- Ports for serial, parallel, external, monitor, keyboard/mouse & VLB Docking Station
- Carrying Case, AC Adapter
- Weight **6.2lbs**

Mono 64GS $1695
Dual Scan.........................$2195
Active Color.....................$3175

Everex StepNote

- Intel SL Enhanced 486DX33 (Upgradeable to DX4-75)
- **8/16K** Cache (Built-in)
- Built-in Audio, **MIC, Speaker, Sound Blaster & Windows compatible**
- **32-bit VESA Local Bus Video**
- **1MB Video RAM with Win Accelerator**
- **PCMCIA III** or 2 IIs
- 4MB RAM (exp. to 8/12/20/36MB)
- 1.44MB Floppy Drive
- Removable **250MB** Hard Drive (340MB/540MB Optional)
- Built-in **front-center 19mm Logitech Trackball with scaleable Mouse Pointer & Auto-tracking**
- **Ni-MH battery**, Quick Charge 1.5hrs. Supports "Hot Swap" battery change Battery Gauage
- Ports for high-speed serial, parallel, external, monitor, keyboard/mouse & Docking Station
- Carrying Case, AC Adapter
- Weight **5.3lbs**

Mono 64GS.......................$1855
Dual Scan $2345
Active Color $3325



Model 9200

- Intel SL Enhanced 486-33 MHz CPU (Upgradeable to **DX4-100**)
- **128 Cache**
- Built-in **Audio, MIC, Speaker, Sound Blaster & Windows compatible**
- **32-bit VESA Local Bus Video**
- **1MB Video RAM** with **Win Accelerator**
- **PCMCIA III & II**
- 4MB RAM (exp. to 8/12/20/**36MB**)
- 1.44MB Floppy Drive
- **Removable 250MB** Hard Drive (340MB/540MB Optional)
- Built-in **front-center 19mm Trackball**
- **2 NiMH batteries**, Quick Charge 2hrs.
- Ports for serial, parallel, external, monitor, keyboard/mouse & VLB Docking Station
- Carrying Case, AC Adapter
- Weight **6.6lbs**

Mono 64GS.......................$1845
Dual Scan $2335
Active Color $3315

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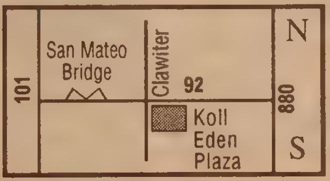
1-800-728-6688
Hours: Monday-Friday 8:30-6 Saturday 9-12:30 & 1:30-5



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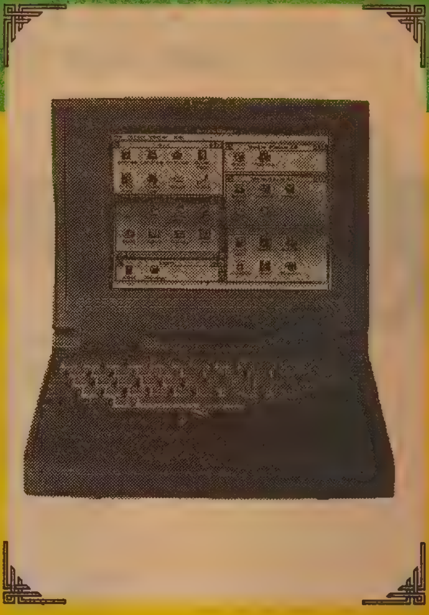
	Mono	Dual Scan
• 486SX-25	$1370	$1940
• 486DX-33	$1515	$2085
• 486DX2-66	$1545	$2115
• 486DX4-75	$1770	$2340
• 486DX4-100	$1875	$2445

Includes:
Mono, Dual Scan Color (TFT Active Color Available), 4 MB RAM, 120 MB HDD, 1 MB SVGA VLB Card, Metal Hydrate Battery, 16 Bit Sound Card, PCMCIA Type III Slot.
Per MB Adittional RAM....**Add $45**

486-SL50 MONO w/4 MB/120 MB	$1150
486-SL50 COLOR w/4 MB/120 MB	$1500
486-SX25 PCMCIA Type II SUBNOTEBOOK	$1220
486-SX25 PCMCIA Type III VGA MONO w/4MB/120MB	$1220
486-DX33 PCMCIA Type III VGA MONO w/4MB/120MB	$1360
486-DXII66 PCMCIA Type III VGA MONO w/4MB/120MB	$1400

Upgrades:

200 MB HDD	Add $100
340 MB HDD	Add $220
520 MB HDD	Add $420
Dual Scan Color	Add $570
TFT Active Color	Add $1420
PCMCIA 14400 Fax Modem	$185



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Intel Made Motherboard PENTIUM-90 MHz w/256K CACHE	$1850
Intel Made Motherboard PENTIUM-66/60 MHz W/256K CACHE	$1650/1580
PCI 486-66/33 MHz W/256K CACHE	$1170/1150
WIT 486DX4-100/75 MHz W/256K CACHE	$1370/1290
WIT 486DX2-66/40 MHz W/256K CACHE	$1030/930
WIT 486DX-50/33 MHz W/256K CACHE	$1050/1000
WIT 486SX-33/SX-25 MHz W/256K CACHE	$890/880
WIT 386DX-40/SX-40	$830/815
IBM 486SLC2-66/99 MHz W/64K CACHE	$920/CALL
IBM 486SLC2-50/75 MHz W/64K CACHE	$870/1025

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- ✚ IDE FDD/HDD Controller
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- ✚ Mini-Tower Case w/230W Power Supply
- ✚ 101-K Keyboard
- ✚ Windows Accelerator SVGA w/1 MB
- ✚ 14" SVGA .28 dp Monitor
- ✚ 72 Hour Burn-In & Fully Tested

(For VESA Local Bus With 32-Bit VLB & 32-Bit VLB SVGA Add $35
For PCI 586 w/PCI IDE & PCI Diamond Viper Add $320)

MULTIMEDIA PRODUCTS

Sound Blaster 16-Bit	$85
Speakers Pair	20
Multi-Media Kit w/Titles	300
Sony/Mitsumi CD-ROM DblSpeed	145
Toshiba CD-ROM 3401-B	285

DRIVES

210MB/250MB	$180/215
270 MB/340 MB IDE HDD	225/235
420 MB/540 MB IDE HDD	250/325
Teac 1.2/Epson 1.2 FDD	45
Teac 1.44/Epson 1.44 FDD	38
Colorado 250 MB Tape Back-Up	170
Tape Cartridges	23

CONTROLLERS

ISA IDE 2FD/2HD w/2S/1P/1G	$15
VESA IDE 2FD/2HD w/2S/1P/1G	25
Vitex AT I/O (2S/1P/1G)	12
Promise ISA IDE Cache Controller	100
Promise VESA IDE Cache Controller	150
Adaptec 1542C SCSI Controller	190
Adaptec 1542F w/Kit SCSI II Controller	235
Adaptec 2842VLK VESA SCSI Controller	275
Adaptec 2742TK EISA SCSI Controller	350

MODEM & FAXES

On-Line 2400 Modem	$30
Digicom Fax Modem 14400 Fax/14400 Modem	90
On-Line Pocket Fax Modem 14400 Fax/14400 Modem	150
On-Line 28800 Fax Modem 28800 Fax/28800 Modem	185

MONITORS

Eye-Q 14" Amber	$85
Eye-Q 14" VGA Mono	105
14" SVGA 1024x768 .39	195
14" SVGA 1024x768 .28	205
14" SVGA 1024x768 .28 NI	215
ViewMagic 15" w/Microprocessor	335
ViewMagic 17".26 Tube w/Microprocessor Low Radiation	685
ViewSonic 6E SVGA .28 NI	285
ViewSonic 15 1280x1024 .28 NI	445
ViewSonic 17G 1280x1024 .28 NI	780
ViewSonic 20 1600x1280 .28 NI	1495
ViewSonic 21 1600x1280 .29 NI	1725

VIDEO CARDS

Monographic Card	$15
VGA w/256K	30
SVGA w/1 MB ISA	55
Cirrus Logic SVGA VLB w/1 MB	80
Diamond Stealth 24 VLB w/1 MB	145
Diamond Stealth Pro VLB w/2 MB	315
Diamond Viper VLB w/2 MB	335
Diamond Viper PCI w/2MB	355

MISC.

IBM 486-SLC II 99 VLB MB	$CALL
IBM 486-SLC II 75 VLB MB	345
IBM 486-SLC II 66 VLB MB	205
IBM 486-SLC II 50 ISA MB	140
(Math Co-Processor....Add $35)	
Pentium 586 60/66 w/256K Cache Motherboard w/CPU	900/950
PCI 486 Motherboard w/o CPU	260
AT Desktop 230W Power Supply	40
AT Full Tower 250W Power Supply	45
PSII 230W Power Supply	35
XT 150W/UL Power Supply	35
Mini Tower Case w/230W PS	60
Baby Desktop Case w/230W PS	65
AT Full Desktop Case w/230W PS	85
Mid Tower Case w/230W PS	80
Full Tower Case w/250W PS	95
Power Surge Protector	6
Power Cable, IDE Cable or I/O Cable	3
1 MB RAM (each)	40
4 MB RAM (each)	150
CPU/Math Co-Processors	CALL
CPU Cooling Fan	8
3 Button Serial Mouse	8
Green PC Power Controller	CALL

CALL FOR OTHER ITEMS NOT LISTED

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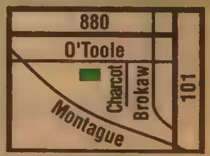

HOURS:
Mon-Fri: 9-5:30
Saturday: 10-3

Classes, Seminars, Workshops

July

July 24–August 4 Installation And Usage Of An Internet Email System On Your Own Computer (Mac) Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

July 25 Advanced Excel 4.0 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

July 25 dBase IV Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 25 Intermediate Excel For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 25 Intermediate Lotus 1-2-3 2.4 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

July 25 Intermediate PageMaker 5.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

July 25 Microsoft Excel For Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 25 QuarkXPress For Windows Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 25–26 Novell 3.1x Advanced Administration Class. Oakland. MIS Services, Inc. Call: (510)208-5700.

July 25–26 Understanding Email & Messaging Systems Seminar. San Jose. Data-Tech Institute. Call: (201)478-5400.

July 26 Fox Pro 2.5 For DOS/Windows Level 3 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 26 Intermediate Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 26 Intro To Lotus Approach 2.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

July 26 Lotus 1-2-3 For DOS/Windows Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 26 PageMaker For Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 26 WordPerfect/DOS Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 26–27 Advanced 2D AutoCAD Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

July 26–27 Basic 2D Auto-Architect Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

July 26–27 Object-Oriented Database Technology And Relational Remodeled Seminar. San Jose. DCI. Call: (508)470-3880.

July 26–27 Visual Basic Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 26 & 28 Beginning Illustrator Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 26 & 28 Beginning Persuasion Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 26 & 28 Intermediate Excel Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 26–29 Customizing AutoCAD Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

July 26 & 29 Intro To Project For Windows 3.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

July 26–August 30 Nonlinear Editing With Adobe Premiere Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

July 27 Access 2.0 Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 27 AccPac Plus Training For Beginners Class. San Francisco. J.C. Lukrich & Co. Call: (415)905-6900.

July 27 Excel 5.0 Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 27 Intermediate Lotus 1-2-3 For DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 27 Intro To Ami Pro 3.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

July 27 Intro To Word For Windows 2.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

July 27 Macintosh Network Administration Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 27 WordPerfect/Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 27–28 Beginning Adobe Photoshop 2.5 Class. Pleasant Hill. Contra Costa Office of Education. Call: (510)943-8332.

July 27–29 AutoLISP Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

July 27–August 10 QuarkXPress Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

July 27–August 10 Swivel 3D Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

July 28 Advanced Paradox For Windows 1.0/4.5 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

July 28 Intermediate Windows 3.1 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

July 28 Intermediate Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 28 Intermediate WordPerfect For Windows 6.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

July 28 Word For Windows 6.0 Level 3 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 28 WordPerfect 6.0 For DOS Level 3 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 28–29 Advanced 2D Auto-Architect Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

July 28–29 Expert 2D AutoCAD Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

July 28–29 LANs: Design, Operations, And Management Class. San Francisco. UC Berkeley Extension. Call: (510)642-4111.

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July 29 Advanced Photoshop Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 29 dBase IV Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 29 Excel 5.0 Macros Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 29 Illustrator For Windows Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

July 29 Intermediate DOS 6.0 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

July 29 Intermediate Excel For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

July 29 Intro To Excel Class. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

July 29 WordPerfect 6.0 For Windows Level 3 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

July 29–30 Beyond Marketing: Publicity And Public Relations For Multimedia Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

July 29–August 26 Electronic Post-Production For Independent Film, Video, And Multimedia Makers Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

July 30 Intro To Word Class. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

July 30 Macintosh Basics For Multimedia I Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

July 30 Nonlinear Editing: From Analog To Avid Class. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

July 30 Setting Up A WWW Server To Publish Multimedia On The Internet Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

July 30–31 CoSA After Effects: Digital Effects And Layering On The Desktop Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

July 30–31 Hands-On Video Toaster Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

July 30 & August 27 Choosing An Internet Service Provider And Bandwidth: Costs And Benefits Of The Alternatives Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

July 31 Internet 202 Class. San Francisco. Internet Literacy Consultants. Call: Matisse Enzer, (415)469-8271.

July 31 Intro To WordPerfect. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

July 31 Macintosh Basics For Multimedia II Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

August

August 1 Intro To DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 1 Intro To Word For Windows 6.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

August 1 System V Rel. 4 Network Application Programming Class. Pleasanton. AT&T Technical Education Center. Call: 1-800-TRAINER, prompt 1, ext. 6564.

August 1 Word For Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 1–2 Architectural Design With Arch-T By KETIV Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 1–2 Printed Circuit Design On AutoCAD Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 1–3 Novell NetWare 3.11 To 4.0 Update Class. Oakland. MIS Services, Inc. Call: (510)208-5700.

August 1–18 Electronic Music And Interactive Multimedia Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

August 2 Intro To Windows 3.1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 2 Intro To Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 2 Taking QuickTime Online Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

August 2 WordPerfect 6.0 For DOS Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 2–3 Accessing The Internet Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

August 2–3 Network Fundamentals Hands-On Class. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 2 & 4 Beginning PageMaker Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 2 & 4 Beginning PowerPoint Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 2 & 4 Intro To The Mac Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 2 & 4 PageMaker For Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 2–9 Painter Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 2–21 Multimedia Production Workshop. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

August 2–30 3D Studio 1 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 3 Intro To Excel 5.0 Class. San

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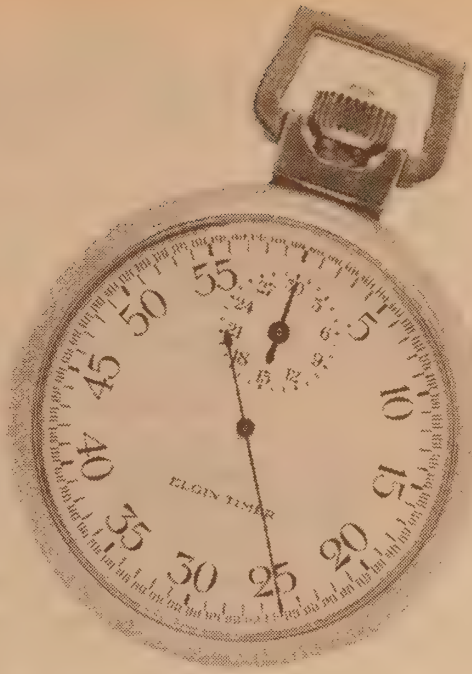
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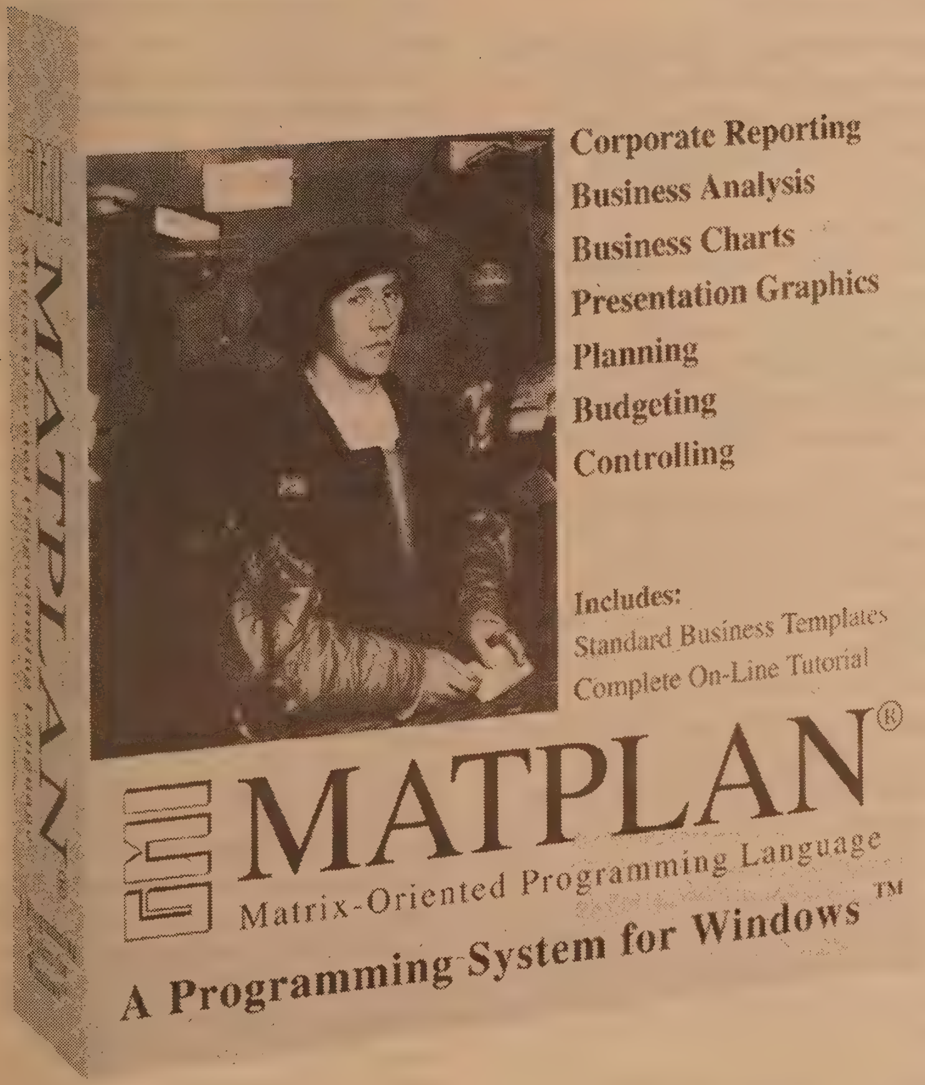
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Speaker: Dr. Bernhard Büttgenbach, CEO of GMI, Inc. Palo Alto.

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"How to implement an Executive Information System with MATPLAN"

Speaker: Mr. Ulrich Teschner, CFO of GMI, Inc. Palo Alto.

"Problems and Solutions of World Wide Integrated Reporting Systems"

Speaker: Dr. Horst Burwick, Founder and Author of MATPLAN

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Francisco. The Dublin Group. Call: 1-800-464-8344.

August 3 Intro To Lotus 1-2-3 Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 3 Intro To MS-DOS 6.2 Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 3 Intro To Quattro Pro For Windows 5.0 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

August 3 Lotus 1-2-3 For DOS/Windows Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 3 QuarkXPress For Windows Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 3–4 Fundamentals Of Telecommunications Seminar. San Francisco. Data-Tech Institute. Call: (201)478-5400.

August 3–4 Mastering Adobe Photoshop 2.5 Class. Pleasant Hill. Contra Costa Office of Education. Call: (510)943-8332.

August 3–5 Managing Assets And Facilities With ARCHIBUS/FM Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 3–31 Advanced Media Synthesis Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 4 IBM PC Clone Hardware Hands-On Class. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 4 Intro To Lotus 1-2-3 3.4 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

August 4 Word For Windows 6.0 Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 4 WordPerfect 6.0 For Windows Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 4–5 Professional Solids Modeling With AME Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 4–5 T1/T3/Sonet Networking Seminar. San Jose. Data-Tech Institute. Call: (201)478-5400.

August 4–12 Beginning Photoshop Workshop. Santa Clara. UC Santa Cruz Extension. Call: (408)427-6620.

August 4–25 3D Modeling On The Mac Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

August 5 Computers For Dummies Seminar. Richmond. Network Computing. Call: (510)235-9766.

August 5 Fox Pro 2.5 For DOS/Windows Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 5 Intro To WordPerfect For DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 5 Networking For Dummies Seminar. Richmond. Network Computing. Call: (510)235-9766.

August 5 Photoshop Master Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 5 Word For Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 6 Beginning Digital Editing With QuickTime Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

August 6 CNE Hands-On Study Group. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 6 Intro To Excel/Lotus/Quattro Pro Class. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

August 6 Using The Internet Part 2: Resource Tools Class. UC Berkeley campus. UC Berkeley Extension. Call: (510)642-4111.

August 6–7 Hi-8 Editing With The Video Toaster Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

August 6 & 13 Intro To Network Management Class. Santa Clara. UC Santa Cruz Extension. Call: (408)748-7375.

August 6–27 Advanced Macromedia Director Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

August 7 Intermediate Digital Editing With QuickTime Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

August 7 Intro To Access/FileMaker Pro/Paradox Class. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

August 8 Fundamentals Of UNIX For Users Class. Pleasanton. AT&T Technical Education Center. Call: 1-800-TRAINER, prompt 1, ext. 6564.

August 8 Intro To Document Management Class. San Francisco. Network Services Group. Call: (510)538-2630.

August 8 Intro To Windows 3.1 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

August 8 Network Administration Seminar. San Francisco. Network Services Group. Call: (510)538-2630.

August 8–9 Asymetrix Toolbook For Windows On The IBM PC Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

August 8–9 Beginning Photoshop Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 8–9 Working With AutoCAD ADE Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 9 Fundamentals Of UnixWare Seminar. San Francisco. Network Services Group. Call: (510)538-2630.

August 9 IBM PC Clone Hardware Hands-On Class. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 9 Intro To Ami Pro 3.0 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

August 9 Intro To Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 9 Quattro Pro 5.0 For DOS/Windows Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 9 WordPerfect 6.0 For DOS Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 9 WordPerfect/DOS Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 9–10 Professional AutoCAD Designer Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 9 & 11 Beginning Illustrator Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 9 & 11 Microsoft Excel For Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 10 Intro To Word For Windows 2.0 Class. Santa Clara. The Dublin Group. Call: 1-800-464-8344.

August 10 Intro To WordPerfect For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 10 Networks For Legal Professionals Class. San Francisco. Network Services Group. Call: (510)538-2630.

August 10 Paradox 4.5 For DOS/Windows Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 10 Windows With Networks Administration Seminar. San Francisco. Network Services Group. Call: (510)538-2630.

August 10–11 Beginning QuarkXPress 3.3 Class. Pleasant Hill. Contra Costa Office of Education. Call: (510)943-8332.

August 10–11 Implementing OLE 2.0 Containers And Objects With Visual C++ And The Microsoft Foundation Classes Section 2 Class. UC Berkeley campus. UC Berkeley

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Deadline: October 1, 1994

Store Name: ______________________________

Store Manager: ______________________________

Address: ______________________________

City: ____________________ **State:** _____ **ZIP:** _______

Phone: ________________ **Fax:** ________________

What does your business specialize in, and who are your in-house experts for each specialty? (e.g., multimedia, hardware, software, components, service)
List up to three:

Specialty	**Expert**

What software operating systems does your business support?

MS-DOS__Windows__UNIX (specify variety)____**OS/2__Macintosh__Other** (specify)____

What is your multimedia specialty?

CD Titles__ Video__ Desk Top Publishing__ Production__ Hardware__ Software__ Software__ Development__

List the three top-selling brands sold at your store in 1994:

____

What special value added services (e.g., service, training, support, warranties, return policy, etc.) does your business offer? (Please keep responses under 25 words or we will edit them to fit available space.)

____

____

____

Are you a vendor-authorized sales, service, training, and/or support source?
If so, please list up to five vendors (e.g., Sun, Novell, Hewlett-Packard, Compaq) who have authorized your business to provide these services, and check the areas for which you're authorized.

Vendor	**Sales**	**Service**	**Training**	**Support**

I certify that all the statements made in this survey are true.

Name: ________________ **Signature:** ________________

Title: ________________ **Date:** ________________

Resources

Extension. Call: (510)642-4111.

August 11 Intro To Excel For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 11 Intro To MS-DOS 6.2 Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 11 Live Picture Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 11–12 Customizing AutoCAD Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 11–12 Novell System Supervisor 3.12 Day 1 & 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 11–12 PC Repair Two-Day Hands-On Class. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 11–12 PCB Design And Desktop Manufacturing With AutoCAD & Roland Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 12 Intro To Excel 4.0 Class. San Francisco. The Dublin Group. Call: 1-800-464-8344.

August 12 Paradox For Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 12 WordPerfect 6.0 For Windows Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 13 Intermediate Excel/Lotus/Quattro Pro Class. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

August 13–14 Nonlinear Editing On Avid's Media Composer Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

August 14 Intermediate QuickBooks/Quicken Class. San Jose. InfoMind Computer Training Center. Call: (408)243-1121.

August 15 C For Programmers Class. Pleasanton. AT&T Technical Education Center. Call: 1-800-TRAINER, prompt 1, ext. 6564.

August 15 dBase IV Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 15 PageMaker For Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 15 Quattro Pro/Windows Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 15–16 Telecommunications Technologies For The Non-Engineering Professional Seminar. San Jose. Data-Tech Institute. Call: (201)478-5400.

August 15–19 ISO 9000 Lead Assessor Training Seminar. San Jose. Perry Johnson, Inc. Call: 1-800-479-2020.

August 15–September 5 Photoshop 1 & 2 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 15–September 5 Photoshop 3 & 4 Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 16 FileMaker Pro For Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16 Intermediate Word For Windows Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 16 Word For Windows 6.0 Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 16–17 Color Pre-Press Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 16–17 Understanding LANs Seminar. Sacramento. Data-Tech Institute. Call: (201)478-5400.

August 16–17 Visual Basic Level I Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16 & 18 Beginning FileMaker Pro Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16 & 18 Beginning QuarkXPress Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16 & 18 Beginning Word Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16 & 18 Microsoft Excel For Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16 & 18 PageMaker For Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 16–18 Reengineering Your I/S Architecture For Client/Server And Network Computing Seminar. San Francisco. DCI. Call: (508)470-3880.

August 16–19 Professional AutoCAD Level I Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 16–23 Aldus FreeHand Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 17 Advanced Photoshop Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 17 Excel 5.0 Level 1 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 17 Intermediate WordPerfect Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 17 Paradox 4.5 For DOS/Windows Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 17–18 Mastering QuarkXPress 3.3 Class. Pleasant Hill. Contra Costa Office of Education. Call: (510)943-8332.

August 18 Doing Business On The Internet Seminar. Palo Alto. GeoNet Communications. Call: (415)922-1200.

August 18 Intro To Paradox For DOS Class. Walnut Creek. Computer Education Center. Call: (510)937-2566.

August 18 LAN Fundamentals Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 18 Lotus 1-2-3 For DOS/Windows Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 18 Quattro Pro 5.0 For DOS/Windows Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 18 WordPerfect 6.0 For DOS Level 3 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 18–19 Innovative Site Remediation Technologies Based On The Findings Of The WASTECH Consortium Seminar. San Francisco. American Academy of Environmental Engineers. Call: Ms. Sammi Olmo (410)266-3311.

August 18–September 1 MacroModel Class. San Francisco. Center for Electronic Art. Call: (415)956-6500.

August 19 Computers For Dummies Seminar. Richmond. Network Computing. Call: (510)235-9766.

August 19 Fox Pro 2.5 For DOS/Windows Level 2 Class. Emeryville. Northwest Computer Systems. Call: Cathy Day, (510)653-0808.

August 19 Microsoft Excel For Windows Level II Class. San Francisco. Ciber Training Services. Call: (415)281-6100.

August 19 Networking For Dummies Seminar. Richmond. Network Computing. Call: (510)235-9766.

August 20 Careers In Multimedia Class. San Francisco. SFSU Extended Education. Call: (415)904-7700.

August 20 External Referencing & Paper Space Workshop. Santa Clara. The Copper Connection. Call: (408)970-9838.

August 20 & 27 PC Repair Two-Day Hands-On Class. Oakland. Excel Micro Solutions. Call: (510)836-2040.

August 20–21, 27–28 Hi-8 To QuickTime Class. San Francisco. Bay Area Video Coalition. Call: (415)861-3282.

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CT1718 17" 1280x1024 Green, Digital Ctrl	$685

MAG

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Because ⇧ is the way you want to go

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6FGp 21" w/ OptiClear Surface	$1938

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GDM-17SE1 17" SVGA, .25dpi	$945
GDM-20SE 20" State of the Art	$1797

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CA-1565CP/SP 15" 1280x1024 N-I	$352
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CA-1765CP/SP 17" 1280x1024 N-I	$659

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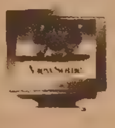

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9GXi (all)..Please call for for updated Prices

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Sony 33A Dual Speed CD-ROM	$138
Mitsumi Dual Speed CD-ROM	$137
Toshiba XM3401B SCSI-II CD-ROM	$287
NEC 3Xi SCSI CD-ROM Drive	$359
Orchid CDS-3110 Dual Speed	$139
Chinon CD-535 SCSI-II CD-ROM	$299

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Colorado DJ20 JUMBO250 250MB	$169
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Summit SE-250 250MB Backup	$159

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Supra Fax Modem 14.4i External	$129
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AT Desktop case w/ 230 Watts P. S.	$52
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INTEL Pentium P5-90 PCI & VLB	$1235
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INTEL 486DX4-100 VLB 256KC	$695
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INTEL 486DX2-66 PCI & VLB 256	$449
INTEL 486DX-50 VLB 256K	$365
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Please Call for Products Not Listed.

PARAMOUNT Super System

PRO P90 SYSTEM

* INTEL P5-99 VLB & PCI w/512K External Cache.
* 16MB RAM 70ns.
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* Teac 1.2Mb & 1.44Mb Floppy Drives.
* VL Bus IDE Card w/ I.O. (2serial, 1Parallel., 1Game).
* VL Bus Spider Black Widow Plus Video Card (32-Bit Graphics, 1600x1200, 16.7Meg Colors)
* 15" Flat Screen SVGA Monitor .28dpi
* Medium Tower Case with 230 Watts Power Supply
* Microsoft Mouse
* Keytronic 101 Enhanced Keyboard

$2695

PRO 486 SYSTEM

* 486 VLB Motherboard w/256K External Cache.
* 4MB RAM
* 250MB IDE Hard Drive.
* Teac 1.2Mb & 1.44Mb Floppy Drives.
* VL Bus IDE Card w/ I.O. (2serial, 1Parallel., 1Game)
* Vesa Local Bus Video Card w/ 1MB Ram.
* 14" SVGA Monitor 1024x768 .28dpi Non-Interlaced
* Mini Tower Case with 230 Watts Power Supply.
* Logitech 2 Buttons Mouse
* 101 Enhanced Keyboard

486DX-40	486DX2-50	486DX2-66
$1085	$1115	$1155

486 MULTIMEDIA SYSTEM

* 486DLC-40 System w/ 128K External Cache Memory.
* 4MB RAM.
* Teac 1.2Mb & 1.44Mb Floppy Drives.
* IDE Card w/ I.O. (2serial, 1Parallel., 1Game).
* 250MB IDE Hard Drive.
* SVGA Video Card w/ 1MB Ram.
* 14" SVGA Monitor 1024x768 .28dpi Non-Interlaced.
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* Labtec CS550 Amplified Speakers.
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* Mini Tower Case with 230 Watts P. S.
* Microsoft Compatible Mouse.
* 101 Enhanced Keyboard.

$1229

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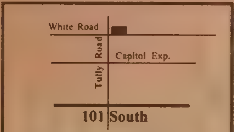

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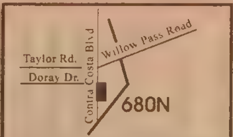

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DUAL PENTIUM SYSTEMS.....NOW AVAILABLE AT NOW!!!

Things That Make You Go Hmmmm! #2

For many years, PC users opted to use the more expensive SCSI interface over the IDE for three main reasons: Higher throughput, Higher drive capacities and the ability to "daisy chain" peripherals. Recent development of IDE interface brings it close to the SCSI. The new *Enhanced IDE* interface standard offers new features such as: 1) increased throughput up to 16.7MB/sec, 2) increased drive capacities to 8.0+ GB and 3) ability to support multiple peripherals off the same controller. The Enhanced IDE interface is currently used in some of our Pentium systems.

Hmmmm! Hmmmm! Hmmmm! Hmmmm! Hmmmm!

The recent introduction of 64-bit architecture, whether it's on the motherboard or the video card, has created confusion among new PC buyers who often believe they're getting a *64-bit based PCI* system. The truth is the PCI bus is still at 32-bit, but the 64-bit bus is usually between the Pentium and memory (RAM & Cache). Likewise, a 64-bit based video card has the 64-bit bus between the Graphics accelerator chip and the video memory. Once the 64-bit PCI bus is fully developed, you can count on NOW to be the first to introduce it!

Hmmmm! Hmmmm! Hmmmm! Hmmmm! Hmmmm!

The Upgradeability of a new system is probably the most important element new buyers look for, and often give it more weight in the decision process than it deserves. Realistically speaking, at the rate the PC industry is advancing, by the time you're ready to upgrade you're probably better off buying a new system or motherboard. For example, many of you are anxiously awaiting the P24T OverDrive which will go into DX/DX2 systems that have 32-bit bus, but for a little more money you will probably be able to buy the more advanced 64-bit Pentium Processor and motherboard.

From the Engineering Department of NOW Electronics, Inc.

REVENGE

$2895

Pentium 66MHz
$2995

Pentium 60MHz Processor
Intel Premiere Motherboard
Diamond Viper PCI Video

Specification:

- 60MHz Intel Pentium Processor 16K
- Intel Premiere/PCI 64-bit Motherboard
- 16MB 70ns RAM, 256K WB cache
- Western Digital 425MB IDE 12ms HD
- 1.44MB Floppy Drive
- ViewSonic 15ex Flat .28dp NI Monitor
- PCI Diamond Viper PCI 2MB VRAM
- PCI Integrated Enhanced IDE Controller
- Deluxe Medium Tower Case 250W
- 101 KeyTronic Keyboard
- 2-PCI, 4-ISA and 1-PCI/ISA slots
- OverDrive Socket, 16554 Ports
- DOS 6.2, Windows 3.11 & Mouse

Special Features:

The Revenge incorporates the latest motherboard from Intel Corporation-Premiere Batman, and a Video Card that is designed by the leader in Graphics accelerator Cards-Diamond Computer Systems.

*Benchmarks**

- *WinMarks (million)*.......................**84**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*................................**2699**
  - *FPU*................................**1069**
- *iCOMP*....................................**510**
- *SPECint/fp92*.....................**63/55**

ECCENTRA 17

$4195

Pentium 90MHz Processor
Qlogic RISC PCI Controller
17" IDEK .26dp Monitor

Specification:

- 90MHz Intel Pentium Processor 16K
- Intel Premiere/PCI II Plato 64 bit
- Intel Neptune PCI Chip-set
- 16MB 70ns RAM, 256K WB Cache
- 540MB Quantum SCSI-2 Fast 256K
- 1.44MB Floppy Drive
- 17" IDEK Vision Master .26dp 1600x1280 Monitor (must see!)
- PCI ATi Turbo Mach64 64 bit 2MB VRAM
- PCI Qlogic Fast Wide SCSI-2 Controller
- Full Tower Case 300W PS
- Focus 2001 Click Keyboard
- 2-PCI, 4-ISA and 1-ISA/PCI slots
- OverDrive Socket, 16550 UART Ports
- DOS 6.2, Windows 3.11 & Mouse

Special Features:

With Benchmarks of 123Mil Winmarks on the Video and up to 20MB/Sec sustained transfer rate on the hard drive, the Eccentra is the best choice for applications that are video and hard drive intensive.

*Benchmarks**

- *WinMarks (million)*...................**123**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*................................**3493**
  - *FPU*................................**1604**
- *iCOMP*....................................**735**
- *SPECint/fp92*.....................**90/72**

ENIGMA 90

$5195

ENIGMA 100
$5495

Pentium 90/100MHz Processor
Diamond ViperPro 4MB
17" NEC 5FGp Monitor

Specification:

- 90/100MHz Intel Pentium Processor 16K
- Intel Premiere/PCI II Plato 64 bit
- Intel Neptune PCI Chip-set
- 16MB 60ns RAM, 256K WB Cache
- 1.0GB Quantum Empire FSCSI-3 9ms
- PCI Adaptec 2940 FSCSI-2 Controller
- 1.44MB Floppy Drive
- 17" NEC 5FGp 1280X1024 Monitor
- PCI Diamond ViperPro 64-bit 4MB VRAM
- GT-300 Full tower case 300W w/Door
- Focus 9000 Programmable Keyboard
- 2-PCI, 4-ISA and 1-ISA/PCI slots
- OverDrive Socket, 16554 Ports
- DOS 6.2, Windows 3.11 & Mouse

Special Features:

Enigma delivers a performance that is unprecedented on a PC platform, its benchmarks exceed those of workstations that often cost 3–4 times as much. Enigma also features the sharpness and brightness of the NEC 5FGp 17" monitor.

Benchmarks (100MHz)*

- *WinMarks (million)*.......................**91**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*................................**3988**
  - *FPU*................................**1782**
- *iCOMP*....................................**815**
- *SPECint/fp92*...................**100/80**

SERVER MPE

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Server MPE is designed to take full advantage of the 32-bit Windows NT and the Multi-Processor technology. By combining two Pentium 90MHz Processors, EISA/PCI Buses and Fast Wide SCSI-2 hard drive/controller, this server is guaranteed to deliver the ultimate performance ever recorded. However, don't let the name scare you away, Server MPE is also an excellent stand alone system for high power users. Please call for more information.

- DUAL Pentium 90MHz Processors
- 1xP54C and 1xP54CM 90MHz processors
- EISA/PCI Multi-processor 64-bit Architecture
- 512K Write back Cache, Flash EPROM
- Intel Neptune PCI Multiprocessor Chipset
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- 2.1GB Seagate ST2550W 8ms Fast Wide SCSI-2
- PCI Adaptec 2940W Fast Wide SCSI-2
- 2.88MB high Density Floppy Drive
- 14" SVGA .28dp NI Monitor
- SVGA 1MB Video Card
- Server Case with 300W PS and Doors
- 101 Enhanced Keyboard
- 3-PCI, 3-EISA and 1-PCI/EISA slots
- 2 Serial 16550 and 2 Parrallel Ports
- DUAL Pentium OverDrive ZIF Socket
- Microsoft Windows NT
- NEC 3Xi CD-Rom

**Obtained from the Manufacturers' Specs/ads*

RISC Processor Based Systems-32-bit/64-bit Local Bus/PCI-MIPS and DEC's Alpha!

Introducing a new line of high-performance systems based on RISC processors. Now you can configure your own RISC based system. All systems are Pre-loaded with Microsoft Windows NT and are specifically tuned to optimize its performance.

MIPS RISC 4000/4400 50/100MHz & 75/150MHz

- 64-bit MIPS design RISC Processor
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- R4400PC-100/150MHz (2X) 32K int. Cache
- 512K External L2 Cache
- 16MB RAM 72-pin 64-bit Bus (max 256MB)
- 540MB Fast SCSI-2 8.5ms Hard Drive
- 64-bit Integrated Fast SCSI-2 interface
- 1.44MB High-density Floppy Drive
- 64-bit Local Bus Video adapter 2MB VRAM Upgradeable to 4MB 1280x1024 16.7M colors
- Deluxe Full-Tower Case 250W with door
- 101 Enhanced PS/2 compatible Keyboard
- 5-ISA Expansion Slots
- Integrated 2S and 1P Ports
- 32-bit Integrated Ethernet adapter
- Microsoft Windows NT with License
- Designed and Manufactured in the U.S.A.
- (Monitor not included)

R4000 50/100MHz........$3995
R4400 50/100MHz........$4295
R4400 67/133MHz........$4595
R4400 75/150MHz........$5195

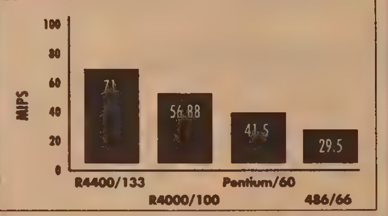
DEC Alpha AXP RISC 166/200MHz-PCI Bus

- 64-bit DEC Alpha AXP RISC Processor
- 166MHz or (200MHz) Processor option
- 256 (512K) External Cache
- 16MB RAM on 64 (128)-bit Memory Bus
- 540MB Fast SCSI-2 8.5ms Hard Drive
- 1.44MB High Density Floppy Drive
- 32-bit PCI Integrated Fast SCSI-2 interface
- 32-bit PCI local Bus Video adapter 2MB VRAM Upgradeable to 4MB 1280x1024 16.7M colors
- Deluxe Baby AT (Full-Tower) Case 250W
- 101 Enhanced Keyboard
- 2-PCI and 3-ISA slots
- Integrated 2S and 1P Ports
- 32-bit PCI Integrated Ethernet adapter
- Microsoft Windows NT with License
- Designed and Manufactured in the U.S.A.
- (Monitor not included)

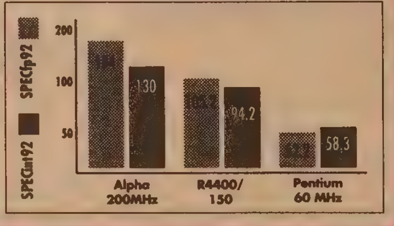
Now Shipping!

DEC Alpha 166MHz.........$5395
DEC Alpha 200MHz.........$6695
Please Call for DEC Alpha on EISA Bus

MIPS R4400/150 vs. Pentium/60



Power Meter benchmarks under Windows NT



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HWY. 680
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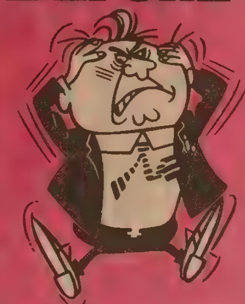
VILLAGE PRKWY.
DUBLIN BLVD.
HWY. 580

Mr. Wise was Shopping for a Computer!

- Should I buy ISA, EISA, VESA or PCI?
- Should I buy from local, name-brand or mail-(dis)order?
- Do mail order companies help me in future upgrades?
- Why should I wait 4–6 weeks to get my system?
- How come some ads look too good to be true?
- How can I tell I will receive what I ordered?

BEFORE



AFTER

Mr. Wise bought a NOW Computer!

- I paid the right price for the right system
- I was treated as a customer, not a number
- System received on the day I was promised
- Configuration was exactly as I specified
- Warranty and Support were outstanding
- I can count on NOW for future upgrade and help
- I recommend NOW to all my friends

COMMANDER

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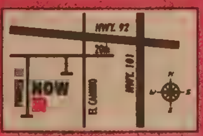

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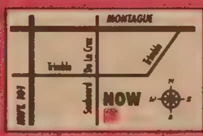

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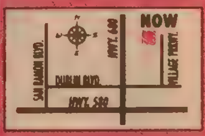

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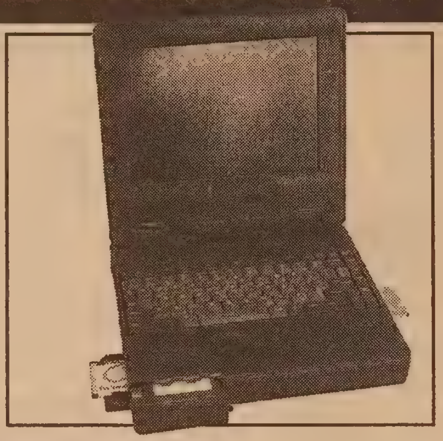

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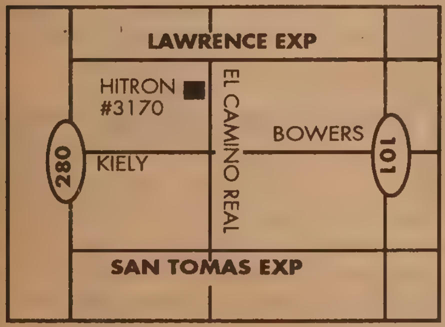

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Bay Area BBSes

By Kathleen Creighton

Health Resources Online

Information And Support As Near As Your Modem

When my friend A. found out she had breast cancer, she immersed herself in the information and support she found from other breast cancer survivors on the medical BBS on Prodigy. She contends she wouldn't have gotten through the ordeal without it, and she's probably right.

I helped S. find an Internet mailing list for ALS, and M. a group for people with tinnitus. And through my own research among the articles on the Health and Medical forum on America Online, I discovered what my doctor was afraid to tell me—that I have multiple sclerosis. I too now participate in an informative and entertaining support group online, a godsend for me as I live in a rural area and can't attend face-to-face meetings in the city.

I have long been fascinated by the existence of these groups. One of the more seductive features of being online is the false sense of intimacy it engenders, but there's nothing false about the camaraderie here. Some groups have an annual get-together, or start newsletters, or assemble photo "yearbooks" of participants. People who participate all the time soon start posting the names of their family members and talking about their jobs, along with their medical problems and their doctor visits. New participants are probably taken aback by how close some of these groups seem to be, but newcomers too are warmly welcomed into the fold.

Some types of groups are more useful than others. A couple of years ago, alt.support.cancer appeared as the first designated support group on Usenet (although other groups, such as misc.handicap and alt.recovery already existed). This group has never had very much traffic because of the big differences in cancer diagnoses and treatment in the population. The arthritis group on Prodigy suffers a little from the fact that there are a number of different types of arthritis and few treatments for any of them, so the bonds of shared experience are weakened. And the turnover is high in any group where the condition is not chronic.

But people suffering from chronic medical conditions, and even chronic psychological conditions such as depression or grief, have a good chance of finding a group or a mailing list especially for them. People readily share their stories and talk about their experiences with diagnosis and treatment. These comparisons of medical care not infrequently lead participants to finding more informed doctors, and to becoming much more proactive in the management of their conditions. Discussion of efficacy of drugs is also very useful, in that it gives participants some information before they decide whether or not to invest the time and money trying out expensive and often marginally effective treatments.

Some groups have doctor-participants similarly afflicted, and their participation helps keep down noise and speculation over useless treatments. But this doesn't necessarily rule out discussion of alternative treatments. The Prodigy multiple sclerosis group, for example, hosts a number of people engaged in controversial bee venom therapy, with results ranging from small to quite dramatic. Similarly, there has been no change in the majority of people who've had their teeth fillings replaced, another controversial treatment. The experiences are recounted for others to read and draw their own conclusions.

Better Health And Medical Forum

America Online is home to Better Health and Medical Forum, an excellent collection of searchable general health articles and specific articles from the National Multiple Sclerosis Society and United Cerebral Palsy Association, Inc., as well as message areas.

In addition to medical issues, there is also a large disabilities forum, and numerous opportunities to chat throughout the week. The chat feature is very popular; the message areas tend to be heavily trafficked but are weak, partly due to the design of America Online's message area software and also because of the hit-run pattern of America Online users.

Continued...

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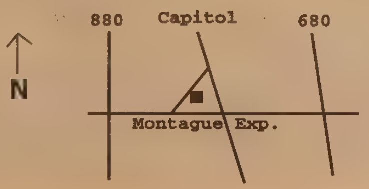

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Network Interface Board. (408)648-1263. 8-N-1, 24 hrs., 14,400. Four lines. Novell networking, CNE training info., Internet email and news. No adult files. Free. Sysop: Gregg McWilliams, CNE. [Exp. #127.]

New! Online-Classifieds. (408)255-2436. 24 hrs. We only do ads: computer hardware, software, books, etc. Free reading. [Exp. #125.]

Nitelog BBS. (408)655-1096. 24 hrs., 300–16,800. DOS/Windows/OS2/UNIX/Mac and Win NT and adult files, 24 lines, 8.4GB. Sysop: Karl Van Lear. [Exp. #125.]

Pacific Exchange BBS. (408)946-8561. 16 lines. 70,000+ files, Internet mail, chat, USA Today news, since 1986. [Exp. #127.]

Paradise City BBS. (408)280-6630. 2400–57,600. Over 30,000 newest IBM and adult files, RIP EGA graphics, mouse support. Free. Sysop: Jim Reed. [Exp. #127.]

Ring Of Fire BBS. (408)248-2076. Silicon Valley NetWare Users Group BBS specializing in Novell, NT, and Windows/Work Groups info and files. [Exp. #127.]

San Jose Advisor. (408)274-6004. 10 am–10 pm, 300–9600. Politically oriented, San Jose city and some state and federal info. [Exp. #125.]

San Jose Connection. (408)956-8819. 8-N-1, 24 hrs., 300–14,400. 2GB online, two CDs, running PCBoard, adult oriented, gay/straight. Sysops: Earl Faneuf and Manuel Martinez. [Exp. #126.]

The Screamin' Mac BBS. (408)257-2029. 14,400. Over 9000 Mac files plus over 20 GIFs. Sysop: Jeff Johnson. [Exp. #127.]

The Support Network BBS. (408)259-0297. 8-N-1, 24hrs., 1200–14,400. ADA Net, ABLEDATA database online, Trace Research Center Library, educational files, RIP graphics. Sysop: Frank Arnold. [Exp. #126.]

The Virtual Reality BBS. (408)246-5434. 8-N-1, 300–14,400. Games, files, and Net mail. Sysop: Jim Busby. [Exp. #126.]

VisionSoft BBS. (408)626-0302 (300–2400), 625-6580 (9600–14,400), 624-5879 (14,400–28,800). 10 lines. Chat forum, CD-ROM, multiuser online game, Usenet, multi-message, Internet pending. [Exp. #126.]

415

A.S.D.I.P. (415)468-3886. 14,400. 31,000 files, over 10GB, adult issues. [Exp. #126.]

The Baud BBS System. (415)343-5799. 14,400. RIP oriented (ANSI too), online RIP games, thousands of files. Free access. [Exp. #126.]

Bay Area Luv Connection. (415)822-7550. 24 hrs., 16 lines. Adult board. Fee, women free. Voice: (415)239-1028. Sysop: Ronni. [Exp. #126.]

Career Connections. (415)917-2129, 917-2125. 8-N-1. View and respond online directly to the recruiters. Telnet: career.com . Free. Sysop: S. Dave. [Exp. #126.]

Clipboard. (415)239-0454. 28,800. Pcboard, Clipper files, FidoNet/Intelec/Internet/OS2Net (Mac, job listings, for sale), and doors. Sysop: George Jereza. [Exp. #125.]

The CyberDen. (415)472-5527. 14,400. The worldwide alternative music and entertainment network, Mac/PC GUI, Usenet and Internet support. [Exp. #125.]

DPNet BBS. (415)788-8663. 8-N-1, 9600–14,400. Free consultant job listings, Usenet newsgroups, professional organizations, and technical SIGs. [Exp. #127.]

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Games & Stuff BBS. (415)369-1110. 8-N-1, 24 hrs., 14,400. Lots of shareware games and utilities, adult files with reg. 30 min. free/day. [Exp. #126.]

Golden Gate Computer Society BBS. (415)457-2516. 24 hrs., 14,400. Four lines. 2GB of files, ILink, Cal-Link, Usenet and Internet email ($24/year). [Exp. #126.]

Home Buyer's Fair! Online. (415)570-7133. 24 hrs., 9600. Market, title, first-time home buyer information; current mortgage rates. [Exp. #125.]

IBBS West. (415)564-9996. 8-N-1, 24 hrs., 300–14,400. Five lines. PC & compatibles, shareware, utils., adult GIFs, CD-ROM, 13,000 files. Fee. [Exp. #127.]

The Informer BBS. (415)468-6713, 468-6714, 468-6715. 24 hrs., 2400–28,800. Intelec, FamNet, WildNet, Fido, OS/2 Net, Internet, Sci Fi Conf, operating systems, tech specs, and more. Sysop: John Custer. [Exp. #126.]

The Infoway BBS. (415)898-8427. 8-N-1, 14,400. Two lines. Internet email and Usenet news, Marin County calendar and issues, weather. Free. [Exp. #127.]

Intimate Images. (415)598-0898. 1200–16,800. Original adult images and video clips. The Bay Area's finest adult BBS. [Exp. #127.]

Key Software Products BBS. (415)364-9847. 5 pm–8 am M–F, 24 hrs. wknds. 1200/2400/9600. Tech support for the Last Byte Memory Manager. Internet email, faxmail, Simtel-20 shareware. Free. Sysop: Dan Lewis [Exp. #127.]

LegalNet. (415)454-0772. 14,400. Join the California online legal community—lawyers only! [Exp. #126.]

Lincoln's Cabin BBS. (415)752-4490. 2400–28,800. Internet email, Usenet, RIME, Boardwatch and Connect magazines online, RIP graphics. Free trial. [Exp. #127.]

The Mac Daddy BBS. (415)587-9052. 24 hrs., 14,400. Two nodes. All Mac FirstClass, FidoNet, OneNet, two CDs, tons of local files. Sysop: Jonathan Mergy, Robert Pomon. [Exp. #127.]

Marin Online. (415)457-1884. 14,400. The online community of Marin—travel online at 14.4 to beautiful Marin. Sysop: James Preston. [Exp. #126.]

Near Side BBS. (415)369-5063. 1200–14,400. Software support, many online games, growing transfer sections. Reg. requested. Sysop: Adam Tordoff. [Exp. #125.]

The Nebuolic Cheese BBS. (415)949-1788. 8-N-1, 24 hrs., 2400–14,400. 120+ msgs., 340MB files, CD-ROM, doors, Internet/Usenet mail. [Exp. #127.]

New Dork Sublime. (415)864-DORK, 255-NERD. 300–14,400. Subliminal news for new dorks everywhere, NIRVANAnet node 9:900/10. Sysop: Biffnix. [Exp. #126.]

NightSHADE Online Services. (415)456-2126. 8-N-1, 24 hrs., 2400–14,400. Multinode, 5+GB, XXX GIFs, games, applications, DOS, Windows, OS/2, 1000+ Internet conf., email-ftp. [Exp. #126.]

Recovery BBS. (415)255-2188. 8-N-1, 300–14,400 + HST. Dedicated to 12-step recovery programs (AA, NA, Al-Anon, CoDA, SAA, etc.). Fido 125/9. Sysop: Rich Gorin. [Exp. #125.]

San Francisco Digital BBS. (415)362-2227. 8-N-1, 14,400. Two lines. Online databases, build your own BBS online, online applications deployment. Free 20 min./day/caller. [Exp. #125.]

San Francisco PC Users Group BBS. (415)621-2609. 8-N-1, 24 hrs., 1200–14,400. Sysop: Richard Couture. [Exp. #125.]

The Shareware Exchange! (415)992-4320. 8-N-1, up to 14,400. Six networks, 345MB files, 10,000+ msgs., 35+ online games. Sysop: Christopher Jong. [Exp. #125.]

The Skull BBS. (415)637-9077. 28,800. 16 nodes, 20GB, hottest Asian/adult graphics, over 18 only, home of The Skull CD-ROM. Free trial. [Exp. #125.]

Solar Hydrogen BBS. (415)494-3116. 8-N-1, 1200–14,400. Alternative energy info—prosperity without pollution. Sysop: Howard H. Smith. [Exp. #127.]

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US Mail should go to: MicroTimes User Group, 3470 Buskirk Ave., Pleasant Hill, CA 94523. **Faxes** are welcome at (510)934-3958. **Email** can be sent to: microx@well.sf.ca.us, or MCI:MICROTIMES.

BBS Spotlight cont.

Medical BBS

There have always been at least a couple of medical support groups on CompuServe and GEnie, but Prodigy really is the mother ship of all online support groups. This culture was so deeply entrenched in Prodigy that when Prodigy started charging access time for the BBS areas, there was intense lobbying to keep the cost of the medical BBS low so that people on disability incomes could still maintain the connections with other people on whom they'd come to rely. The powers that be capitulated, and everyone is offered five "free" hours per month in the medical BBS area in their monthly membership fee; additional hours are $1.20/hour, versus $3.60/hour for access in other areas of the service.

There are also articles online from the National Multiple Sclerosis Society, but the search feature is very weak, and it's a plus feature, which means that access costs $3.60/hour.

Both Prodigy and America Online allow users to receive mail from Internet mailing lists. Prodigy charges per incoming message, but America Online does not.

Usenet Newsgroups

Usenet boasts a number of health-related newsgroups. Unfortunately, since most of them are in the alt.* hierarchy, these groups are not available to many Internet sites. However, BBS users without Internet access can request a specific group from any sysop who gateways Usenet.

AIDS
  sci.med.aids
Alternative Medicine
  misc.health.alternative
Diet/Food/Exercise
  alt.support.diet
  alt.support.eating-disorders
  alt.support.big-folks
  alt.support.obesity
  alt.support.tall
  misc.fitness
  alt.food.fat-free
  rec.food.veg
  rec.food.veg.cooking (moderated)
Disability
  alt.education.disable
  misc.handicap
Medical
  alt.infertility
  alt.med.allergy
  alt.med.cfs
  alt.med.fibromyalgia
  alt.support.arthritis
  alt.support.asthma
  alt.support.attn-deficit
  alt.support.cancer
  alt.support.crohns-colitis
  alt.support.mult-sclerosis
  alt.support.spina-bifida
  alt.support.stop-smoking
  alt.support.stuttering
  alt.support.tinnitus
  misc.health.diabetes
  sci.med
  sci.med.nursing
  sci.med.nutrition
  sci.med.psychobiology
Psychology
  alt.adoption
  alt.dreams
  alt.dreams.lucid
  alt.meditation
  alt.meditation.transcendental
  alt.parents-teens
  alt.psychology.help
  alt.psychology.personality
  alt.support
  alt.support.big-folks
  alt.support.depression
  alt.support.divorce
  alt.support.loneliness
  alt.support.short
  alt.support.shyness
  alt.support.step-parents
  alt.support.tall
  bit.listserv.autism
  sci.psychology
  sci.psychology.digest
Recovery
  alt.abuse.offender.recovery
  alt.abuse.recovery
  alt.support.abuse-partners
  alt.recovery
  alt.recovery.addiction.sexual
  alt.recovery.codependency

Mailing Lists

The Internet/Bitnet Health Sciences Resources list (the list of health-related mailing lists), compiled by Lee Hancock at the University of Kansas Medical Center, can be obtained by ftp from ftp.sura.net in the directory "/pub/nic" as the file "medical.resources.xx-xx". "xx-xx" represents the date of the release. It's updated four or five times a year.

For the most recent files telnet or gopher to KUFacts, (ukanaix.cc.ukans.edu) and login as "kufacts". Look under Internet ToolBox/Internet Health Science Resources. These are updated frequently. ■

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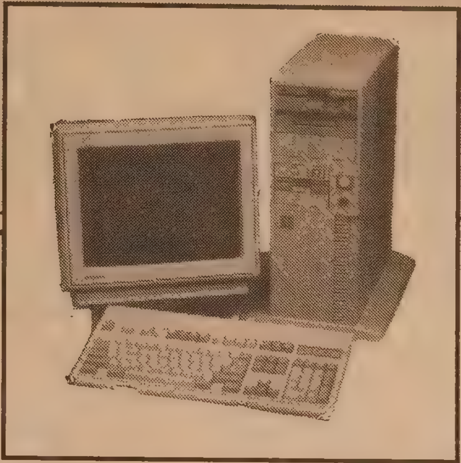

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486DX66/256K	$1169	$1209
486DX50/256K	1189	1249
486DX40/256K	1069	1109
486DX33/256K	1059	1099
486DLC33/128K	919	959
386DX40/128K	889	929

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- 4MB RAM
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486SX33	$989
486CX40	$1099
486DX50	$1169
486DX266	$1159

MOTHERBOARDS

486DX2/66/256K VL Bus	$359
486DX/50/256K VL Bus	369
486DX2/50/256K VL Bus	349
486DX/40/256K VL Bus	309
486DX/33/256K VL Bus	299
486DX4	CALL
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SVGA (1024x768) .28 Non-Int	240
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SVGA Viewsonic 6E Non-Int	285
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Mini Tower	$47
Medium Tower	75
Baby AT	65
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Zol 2400 Baud	$39
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CP30254	250MB IDE	209
CP30334	340MB IDE	229
CP30420	420MB IDE	249
CP3544	540MB IDE	359
CP3540	540MB SCSI	409
CP1370	1.3GB SCSI	CALL
MAXTOR		
7213A	210MB IDE	$199
7245A	245MB IDE	219
7345A	345MB IDE	239
MXT540A	540MB IDE Fast	379
MXT540S	540MB SCSI Fast	429
WESTERN DIGITAL		
WD	213MB IDE	189
WD	255MB IDE	209
WD	340MB IDE	229
WD	420MB IDE	249

KEYBOARDS

Chicony	$17
Keytronic USA	33
Maxi Switch	33
Omnikey 102/Ultra	89/99
Focus w/Cal	35

CONTROLLERS

IDE w/IO	$18
IDE VL Bus	30
SCSI-2 VL Bus (AIR)	235
SCSI VL Bus (Bustek) 545S	CALL
SCSI VL Bus (Ultrastor) 34F	CALL

MULTIMEDIA & CD-ROM

Sound Blaster	89
Sound Blaster Pro	95
Sound Blaster 16ASP	209
Toshiba CD Rom 3401	335
Panasonic CD Rom	195

MOUSES

Microsoft Compatible	$13
Microsoft Serial	49
Microsoft Bus	69
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/usr/school BBS. (415)564-8896. 8-N-1, 24 hrs., 2400. Learn Internet, C, and UNIX by modem. Login: guest. Sysop: Dennis McNamara. [Exp. #127.]

Uncle D's Directory. (415)364-3001. High-speed US Robotics. Computer online service for the mentally aroused. 1.5GB games, unprotects, RIME, classifieds, doors. Free. [Exp. #127.]

VidGame BBS. (415)742-6486, 2400–16,800; 742-6618, 28,800. Nine nodes, steamy adult GIFs, games, 8.5+GB, utils. Free Internet email, newsgroups, FTP-mail. Sysop: George Hassmer. [Exp. #127.]

Virtual Pleasures BBS. (415)802-0500. 24 hrs., up to 14,400. 24 lines (local #s all around Bay Area). Literate adult chat, Internet access, forums, personals, games, erotic matchmaker, and more. Fee. [Exp. #127.]

Wetware Diversions Public UNIX. (415)826-0397. 8-N-1, 24 hrs., 1200/2400. Eight lines. Full Usenet news. Sysop: Eric Swanson (editor@wet.UUCP). [Exp. #127.]

Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software; info, shareware, chat. Sysop: Bob Cram. [Exp. #126.]

Worldnet Direct BBS. (415)974-7303 (14,400), 974-7305 (28,800). PC World back issues; shareware, macros/models from PC World Lotus edition; DOS, Windows, OS/2 files; and more. Sysop: Nancy Miller. [Exp. #126.]

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8-Bit Apple User Group BBS. (510)294-8052. 24 hrs., 300–2400. Apple II, UL/DL, email, games. Free. Sysop: Noel Anklam. [Exp. #126.]

Activist. (510)532-6248. Hot info fer realpolitik junkies, infobahn tyros, culture buzzards, and the toiling masses. Sysop: Walter Alter. [Exp. #126.]

Bay Area Mega Board. (510)247-8300, 12 lines @ 14,400; 247-8313, four lines @ 28,800. UltraChat, games, news, gen and adult nets, 35.16GB file area. Free and fee. Sysop: Sam Thompson. [Exp. #127.]

Bayline BBS. (510)886-9401. 14,400. Eight lines. African-American network, Internet email/Usenet, RIP graphics, games, discussions, and more. Sysop: A. Mitchell. [Exp. #126.]

Beyond Infinity BBS. (510)283-1991. The greatest graphical interface BBS designed. Complete RIP graphics. Tons of files, games. [Exp. #127.]

Camphor Fountain BBS. (510)547-5741. 8-N-1, 24 hrs., 2400–14,400. Baha'iNet, SearchNet, seekers welcome, interfaith discussions, writing, home schooling, parenting. Free. Sysop: Linda Martin. [Exp. #125.]

Caxius BBS. (510)895-6961. 24 hrs., 300–14,400. Technical focus, FidoNet & PCC Net support, 60+ msg bases, active debate forum. Free. Sysop: Ed Correia. [Exp. #127.]

CompuPal. (510)538-2040. 8-N-1, 24 hrs., up to 28,800. Christian BBS, IBM PD, Bible files, 160MB, Bible echo, New Life Digest magazines, etc. Sysop: Richard Yim. [Exp. #125.]

The Dragonhead BBS. (510)417-8718. 8-N-1, 24 hrs., 300–14,400. Online games, local and echo msg. bases, CD-ROM files, off-line mail reader. Free. Sysop: Ray Khechen. [Exp. #127.]

Dr. Jack's Thing. (510)685-8522. 6:00 pm–8:00 am. 14,400. Specializing in WAVs and GIFs, plus all the other stuff. Thousands of new files, programs, utilities. Free/pay. [Exp. #127.]

Friendliest BBS. (510)432-7802. 8-N-1, 24 hrs., 300/1200/2400/9600. MS-DOS shareware, email, no password, no U/D ratios, no time limits. Free. Sysop: Doyle Goodman. [Exp. #125.]

Gold Diggers BBS. (510)568-7807,,,23,23 (must include ,,,23,23 to get BBS). 24 hrs., 2400–14,400. IBM, Atari ST, Amiga, Mac; files, door games, and messages. Donation $10 per year. Sysop: Harry Goldberg. [Exp. #127.]

The Hobby Shop BBS. (510)357-4125. 8-N-1, 28,800. Fun place to meet others; 1.5MB, adult scans, FidoNet. Free trial most areas. [Exp. #125.]

Initiative BBS. (510)654-2253. 8-N-1, 24 hrs., 300–14,400. Political board, documents/discussions on future of socialism in the world. Sysop: Steve Willett. [Exp. #127.]

The Lost Worlds BBS. (510)888-1714. 24 hrs., 14,400. Hottest adult, shareware, chat, games, Internet, Usenet, Fido, msgs. [Exp. #127.]

LZ Nightline BBS. (510)834-0837. Nationwide veterans msg. conference echoes, vet info and support, non-vets welcome. Limited free access. Sysop: Jon Mankowski. [Exp. #127.]

Metropolis. (510)231-0353. 24 hrs., 2400/9600/14,400/19,200. DOS, Windows, OS/2; general purpose, a serious professional system; FidoNet, Usenet, and Internet email soon. Sysop: Michael Chen. [Exp. #125.]

M.O.P.H. BBS. (510)834-5517. Veterans service organization listings and community events. Free. Sysop: Mike Dornner. [Exp. #127.]

Multimedia Download BBS. (510)713-2752. 1200–14,400. Photo/VHS digitizing service. MIDI, AVI, GIF, WAV, VOC, PCX, shareware. Free. [Exp. #125.]

The New-Ark BBS. (510)796-0947. 24 hrs., 300–9600. Tradewars, running on two CD-ROMs. Reg. required. Sysop: Hiram Wolf. [Exp. #125.]

Otoko Empire BBS. (510)370-6253. 24 hrs., 1200/2400. Specializing in gay topics, travel, international pen pals, Male GIFs. Sysop: Hiroshi. [Exp. #126.]

The Phantom Zone BBS. (510)538-9586. 8-N-1, 24 hrs., 300–14,400. Two lines. Online games, offline mail reader, multinode, friendly sysop. [Exp. #126.]

Planet Mirth. (510)786-6560. 14,400. Sinfully silly, Internet news, NIRVANAnet. [Exp. #126.]

realitycheck. (510)527-1662. 14,400. Instant access, coffee, cigars, tech, and text. NIRVANAnet. [Exp. #126.]

Smorgasbord BBS. (510)440-1125. Fremont, Sunnyvale, North San Jose. 70,000 files. Free prize draw. [Exp. #125.]

Tiger Team Buddhist Information Network. (510)268-0102. 24 hrs., 14,400. "America's Buddhist online service." Internet email, Usenet, giga-

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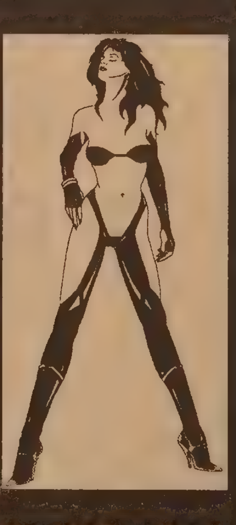

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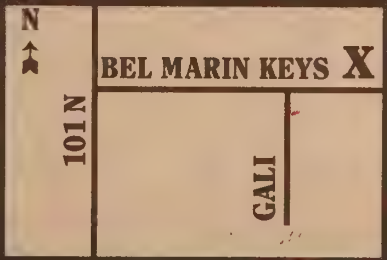

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USER GROUPS

AMIGA

AGA. Meetings: 7th of each month, 7:00 pm, downtown SF. Graphics users group for all Amiga users of 2-D, 3-D, animation, multimedia, and video software. Call: Ollie, (415)863-8792. [Exp. #130.]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:30 pm, College of Marin Science Center, Rm. 191, Kentfield. Desktop Video SIG, Rm. 192, 6:00 pm. Call: (415)479-6717. BBS: (415)459-6621. [Exp. #126.]

AWEST Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415)584-8406. [Exp. #126.]

FAUG—First Amiga User's Group. Meetings: 1st Tues., 7:30 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Q&A, new product demos, public domain software. Call: Mike Fischer, (415)855-9816, BBS (415)341-7566. [Exp. #129.]

RE-AMIGA Redwood Empire Amiga User Group. Meetings: 2nd Tues., 7:30 pm, Rohnert Park Jr. HS, Rm. C-5, 7165 Burton Ave., Rohnert Park. Call: (707)523-9978. BBS: (707)539-6944. [Exp. #126.]

TOGA—The Other Group Of Amigoids. Meetings: Varying Sat., 12:30 pm, Milpitas Community Library, 40 N. Milpitas Blvd., Milpitas. An informal group to share ideas, PD software, and information. Call: Lawrence Brown, (408)984-6036; Randy Abel, (408)356-9405; toga@cup.portal.com . [Exp. #127.]

APPLE

Gravenstein Apple Users. Meetings: 3rd Sat., 10:00 am, Grant School, 200 Grant Ave., Rm. #B4, Petaluma. Call: BBS (707)794-9333, Jack McKenna sysop. [Exp. #129.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #129.]

P.I.E. Apple IIGS SIG. Meetings: 3rd Tues., 7:00 pm, Wilcox High School, Rm. #205, 3250 Monroe St., Santa Clara. Call: Philip Fontaine, (408)258-7641. [Exp. #129.]

San Leandro Apple Eaters Users Group. Meetings: 1st Thurs., 7:30 pm, San Leandro High School, Rm. #204, 2200 Bancroft Ave., San Leandro. Call: Stan (510)351-3973 or Ed (510)651-8521. [Exp. #129.]

SPC Apple User Group. Meetings: 2nd Tues., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Dean Fearn, (510)881-9160. [Exp. #129.]

Stockton Apple Users. Meetings: 3rd Wed., 7:00 pm, Online Connecting Point Computer Store, 5756 Pacific Ave., Stockton. Call: Connie Fodor, (209)474-8508. [Exp. #129.]

Tri-Valley Apple Users. Meetings: 1st Wed., 7:00 pm, Glendale Federal Bank, 3101 Crow Canyon Place, San Ramon. Call: Jerry Carleton, (510)828-6237. [Exp. #129.]

ATARI

ABACUS—Atari Bay Area Computer Users Society. Meetings: 1st Sat. 12:00 noon, Potrero Branch Public Library, 2nd floor, 1616 20th St., San Francisco. DTP/MIDI/Video games SIGs. Call: Roger Sinasohn, (415)469-7924. [Exp. #129.]

Northern California Atari Computer Enthusiasts. Meetings: 3rd Tues., 7:30 pm, Pac Bell Bldg., 3260 Sebastopol Rd., Santa Rosa. Call: Kim Remick, (707)795-8173. [Exp. #126.]

AT&T

AT&T Computer Users Group. Meetings: 1st Wed., 7:00 pm, 50 Fremont St., 40th Floor—near 1st and Mission, San Francisco. Call: Jim Lansing, (415)885-6631 or Joe Mahoney, (415)584-6510. [Exp. #129.]

CAD

Sonoma County AutoCAD Users Group. Meetings: 3rd Tues., 6:30 pm. Call: John Weitzel, (707)525-8147. [Exp. #130.]

Southbay AutoCAD User Group. Meetings: Last Thurs. on even months, 6:00 pm. Food, prizes, and more. Call: Dean Villegas, (408)282-4448. [Exp. #126.]

COMMODORE

C=HUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)531-3734. [Exp. #128.]

CWEST Commodore 64/128. Meetings: 2nd. Wed., 6:30–8:45 pm, Excelsior Library, 4400 Mission, San Francisco. San Francisco. Call: (415)626-9946. [Exp. #126.]

DEC

BayLUG. Digital Equipment Computer User's Society Local User Group. For users of DEC and other hardware. Call: Rich Taylor, (408)776-4978. [Exp. #127.]

DESKTOP PUBLISHING

BMUG Desktop Publishing And Design SIG. Meetings: 3rd. Tues., San Francisco. Call: Les Cowan, (415)641-6033. [Exp. #129.]

Corel Ventura/Ventura Publishing User Group (San Mateo County VPUG). Meetings: 3rd or 4th Mon. (Sept.–May), 6:45 pm, 1800 Rollins Rd., Rm. 14, Burlingame. Call: Elinor Cruze, (415)366-5317. [Exp. #125.]

ELECTRONIC PHOTO-IMAGING

EPUG—Electronic Photo-Imaging User's Group. Meetings: 3rd Friday, 7:00 pm, Ewert's Photo-Scientific, 2090 Duane Ave., Santa Clara. Call: Rik Franz or Jerry Chapman, (408)727-3686. [Exp. #128.]

IBM AND COMPATIBLES

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Montclair. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627. [Exp. #130.]

F.U.N. PC Users Group. Meetings: 2nd Tues., 6:00 pm, SyQuest Technology, 47071 Bayside Pkwy. (corner Gateway Blvd.), Fremont. Visitors welcome, no experience necessary. Call: (510)795-4286 #8. [Exp. #129.]

Golden Gate Computer Society. Meetings: 4th Mon., 7:00 pm, San Rafael Community Center, 618 B St., San Rafael. Free intro to computers class at 6:00 pm. Call: (415)454-5556. [Exp. #129.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm, Napa High School Lecture Hall, 2475 Jefferson St., Napa. Call: Lee Schwab, (707)257-2675. [Exp. #130.]

OS/2 BAUG Enterprise Computing SIG. Meetings: 3rd Mon., 7:00 pm, IBM, 425 Market St., 22nd floor, San Francisco. Call: Larry Baptist, (510)675-2466. [Exp. #129.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm. 110 Pacific #153, San Francisco. For those who use computers in business. Visitors $5. Call: Jordan Rosenberg, (415)788-5338. MCI Mail: 425-1545. [Exp. #130.]

San Francisco Computer Society. Meetings: 4th Mon., 7:00 pm, Presbyterian Church, 1329 7th Ave., San Francisco. CPM and DOS. Call: Bob Forsberg, (415)885-6202. [Exp. #130.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm SIGs, 7:30 pm General Meeting. St. Mary's Conference Center, 1111 Gough St., San Francisco. Call: (415)346-2644, events; Kendall Callas, (415)821-1310; Loyd Cribs, (415)751-5219. [Exp. #129.]

SEF Business Operations SIG. Meetings: 1st Tues. every other month, 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Mike Schmit, (408)244-6826. [Exp. #130.]

SEF International Software SIG. Meetings: 3rd Mon., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Charlie Pfefferkorn, (408)923-7570. [Exp. #130.]

Stanford Palo Alto Area PC User Group. Meetings: Last Wed., 7:30 pm, Varian Auditorium, 3075 Hansen Way (off Page Mil Road), Palo Alto. Call: (415)329-8252. [Exp. #130.]

LEGAL

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed., odd-numbered months, noon, SF Bar Assoc. Boardroom, 7th Fl., 685 Market St. Brown bag meetings. Call: (415)421-5650. [Exp. #128.]

MACINTOSH

AHUG—Apple HyperCard User Group. Meetings: 3rd Thurs., Apple Computer, Bldg. 4, 4 Infinite Loop Way, Cupertino. Meetings include speakers and topics for beginners and experienced HyperCard and AppleScript users. Call: (408)974-1707. [Exp. #126.]

Association Of A32 Users. Meetings: 2nd Sat., 10:00 am, Sunnyvale Community Center Arboretum, 550 E. Remington Ave. (near corner of El Camino and Fair Oaks). Q&A session; guest speakers and vendor demonstrations; shareware, freeware, and PD software disks. Call: (408)263-0398. [Exp. #130.]

Diablo Valley Macintosh User Group (DVMUG). Meetings: 3rd Tues., 7:00 pm, Bancroft School, 2200 Parish Dr., Walnut Creek. Get together with Mac and Performa users. Enjoyable SIG meetings. Call: (510)827-5775. [Exp. #128.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 7:00 pm. A forum for multilingual/multiscript computing. Call: Roger Sherman, (415)859-5146. [Exp. #130.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #129.]

SEF Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple R&D Bldg. 4, 4 Infinite Loop, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)358-5150. [Exp. #130.]

Sequoia Macintosh Users' Group—SMUG. Meetings: 2nd week, 7:00 pm, Founders Hall, Rm. 118, Humbolt State University, Arcata. Call: (707)442-3520. [Exp. #127.]

SPC Apple User Group. Meetings: 2nd Tues., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Dean Fearn, (510)881-9160. [Exp. #129.]

MARKETING

SEF Marketing SIG. Meetings: 4th Thurs., 7:00 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: Bill Ryan, (415)615-7906. [Exp. #130.]

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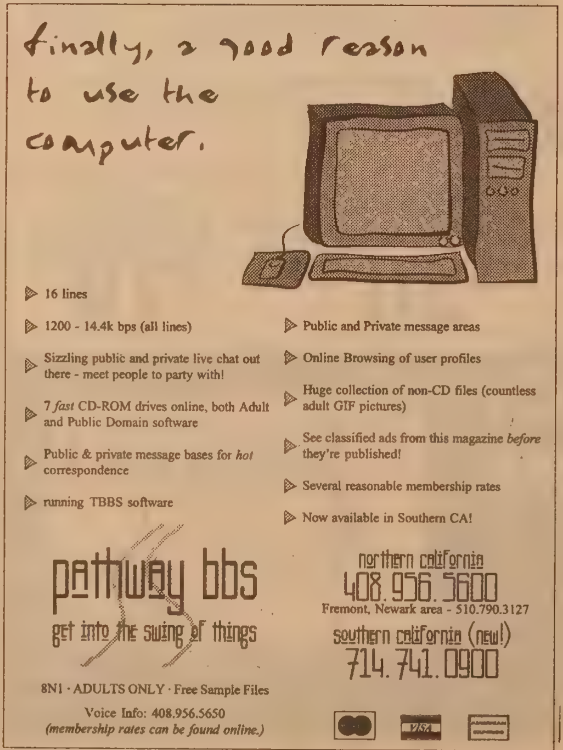

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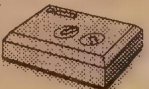

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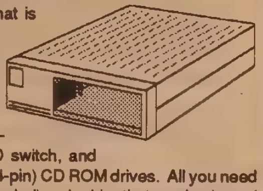
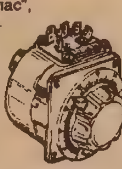
The case for external drives...



You could make a case against having external drives if your computer case has enough bays, but if it doesn't, don't make a case, buy this one! It is a 9.5" x 10.5" x 2.25" beige plastic case that is perfect for CD or hard disk drives. It features a fan-cooled 40W power supply, two external SCSI 50-pin connectors (for daisy chain installation) and internal ribbon cable, SCSI device ID switch, and audio cable for Sony-type (4-pin) CD ROM drives. All you need is an IEC power cord (not included) and a drive that needs a home! Incredible break-through price, hurry!

HSC# 14783 $39.95

NeatBitz...



A. Variable Autoformer -- commonly called a "Variac", although that name is a General Radio trademark, and these "Powerstats" are made by Superior Electric. 5A rating, variable 0-140VAC output. Used, open frame (i.e. not in a case) with large knob, dial plate. Very handy to have, no test bench should be without one! HSC# 14752 $37.50

B. Ultrasonic Transducer Emitter/Receiver set -- the kind that are so handy for sonic ranging, intrusion detection or control projects. Identical .63" dia. housings have 40 KHz transducers made by Murata/Erie. Receiver is rated at -68dB min. sensitivity, transmitter is rated at 110dB min. sound level. Sold as a set. Specification diagram included. HSC#14682 $3.95

C. Camera flash unit -- (not shown) consists of a 2" x 2" printed circuit board of irregular shape that has a 1" long strobe tube with lens and reflectormounted on one side, and circutry mounted on the other. Add 1.5 VDC (an AA cell will do), and a momentary switch, and "flash" you're in business! HSC# 14702 $3.95

D. HPIB Cable -- genuine Hewlett Packard (#92220R) HPIB/GPIB interface cable, 1 foot long. Has dual stackable 24-cond. connector at each end (one is right angle). Fully shielded, rugged metal hoods. HSC# 14803 $12.50

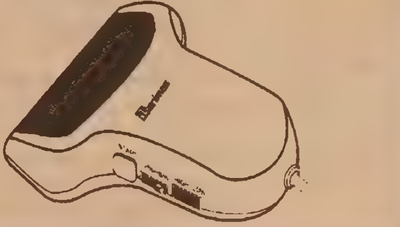
E. Auto Cigarette Lighter Plug w/Coiled Cord -- perfect for radar detectors, handy-talkies, CD players, etc. Coiled cord is 8 ft. long, with a set of adaptors for most types of input jacks, good for 2A @ 12VDC. Compare at $9.95 at the Shack! HSC# 14747 $2.95

Macintosh Scanners

Don't re-type that document into your Mac...don't try to paint the Mona Lisa with your mouse...just say "Scan it!" with these handy scanners by Animas!

A. 256 Gray Scale Hand Scanner -- SCSI interface, 100 to 400 dpi, eight-bit (256 shades of gray), 4.134 inch scan path. Image enhancement software with customizable tool & filters palette, edge detection, etc. New in box with adaptors, cables, manual & software. Requires Mac SE/30 or II family, 8-bit video card, 2 MB RAM. 90-day warranty. HSC# 14808 $79.95

B. "Speed Reader" B&W Hand Scanner -- SCSI interface, 100 to 400 dpi, dithered or Black & White modes, 4.134 inch scan path. Handy for scanning halftones. line-art, etc. "MacSee" software is a simple B&W paint program for editing your images. New in box with adaptors, cables, manual & software. Use with your own OCR software (sorry, we don't have any) for text recognition. Requires Mac Classic, SE, LC, SE/30 or II family, 1 MB RAM. 90-day warranty. HSC# 14809 $49.95

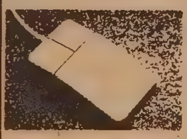


It's More than a Game...It's History!

They should make more computer games like this one..."Their Finest Hour -- The Battle of Britain" by Lucasfilm Games. It is a historically accurate depiction of the air battles that convulsed England during the summer of 1940, and you can relive WW II history by flying a Supermarine Spitfire or a Junkers "Stuka" divebomber (or one of six other fighters or medium/heavy bombers). You get a realistic-looking cockpit instrument panel on your screen, and your chosen craft's performance is based on the actual abilities of the planes. One of the best things about this game (leave it to Lucasfilm to excel in this area!) is the book that accompanies it. It starts off with a 45 page history of the war up to this crucial turning point, and is interspersed throughout with period photographs, campaign maps, profiles and quotes of important personalities, and discussions of strategies. There are even diary entries from British and German fliers that give first-hand accounts of what aerial combat was like in those desperate days. All that is left to experience the realism of battle is to climb into your "cockpit", grab the joystick and follow the mission plan you have built. You can even turn on a "cockpit camera" to record your battle for later viewing. This game was one of the most popular flight simulation games going a couple of years ago, now you can fly along with the aces, and if you are good enough, change history! What a way to painlessly absorb a history lesson, by living it! IBM/DOS, EGA/VGA, AdLib compatible. HSC#14694 $9.95

Huge Mouse Invasion!

Well, no, enormous rodents are not running around here just yet, but we do have a rather large number of mouse-type pointing devices that are looking for a good home next to your computer! Adopt one today! Eek-eek!



A. High-Quality Optical Mouse (shown at left) -- serial interface (9-pin "D-sub") two-button mouse by Mouse Systems, comes with 7" x 7.75" mousepad. No mechanical parts to wear out or get dirty...no balls to clean! New, with driver disk, OEM version (no book or box). HSC# 14719 $14.95

B. MacPRO mouse -- three-button Mac compatible mouseby Animas (shown at right). 350 DPI resolution, Apple ADB interface (4-pin Mini-DIN) for Mac II, IIc, IIci, IIfx, IIsi, LC, SE, Classic, or other Macintosh computer with ADB port. Programmable "cdev" allows full programmability for all three buttons. You even get a paint program called Colorframe (included on driver disk). New in box with manual, mouse-mat, 90 day warranty. HSC# 14718 $19.95

C. Generic Mouse (Super economy version) -- three-button mechanical mouse for 9-pin "D-sub" type serial interface. New OEM version (sorry, no book, software or fancy box), 100% Microsoft Compatible, should work with most mouse drivers. HSC#14673 $4.95

D. Fat Mouse -- For those of you with big hands and bold strokes! This serial-port two-button device is a larger-than-life mouse measuring 4" x 2.5" and 1.25" at the tallest point, and feels comfortably "fat" to the hand. 100% Microsoft Compatible, 200 cpi. opto-mechanical type mechanism. 90-day warranty. New, sorry, no box or software. HSC#14087 $7.95

Hard Disk Full? Put the Squeeze on your Data with SuperStor!

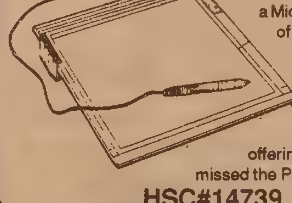
There are thousands of ironic stories in Software City, this is only one of them... Before Microsoft came out with DOS 6.0, there were dozens of thriving software companies writing all sorts of useful DOS utilities, including several varieties of Data Compression utilities. One company, Addstor, had a pair of products called SuperStor 2.0 and SuperStor PRO, which were finished, functioning, mature products. Giant Microsoft released DOS 6.0 with a data compression utility included, and Addstor saw their market evaporate. They eventually went under. The irony? DOS 6.0 had problems in the data compression utility, which required the birth of DOS 6.2...at the same time, a lawsuit by another utility provider against Microsoft was upheld, which we hear means that DOS 6.2's data compression utility may not be included anymore! Where does that leave Addstor? Still defunct, we're afraid, and no longer offering support, but we bought the remaining stock of their SuperStor and SuperStor PRO packages, and offer them at these amazing prices! We have had reports that Addstor's compression technology was more robust than some of the other companies' schemes.

A. SuperStor 2.0 will increase your disk capacity, defragment files, and make better use of your disk space. Need DOS 3.2 or later, not compatible with Zenith or Tandy DOS. HSC# 14674 $6.95

B. SuperStor PRO includes Windows-based JPEG/MPEG compression/expansion utility for .JPG, .BMP, .TIF, .TGA and .PCX graphics files (huge benefits, 20:1 compression typical!), Windows utilities, increased compression and speed over SuperStor 2.0, password protection, Tune-up Analyzer, Integral Disk Cache, Compression Preview, automatic transparent data compression, more! HSC# 14675 $14.95

-- Large quanitities of both types available, dealer inquiries invited! --

Sketch like a pro with HP SketchPro!



Well, the PenMates by Mouse systems featured in last month's ad are long gone. We are sorry if you wanted one but didn't get one, but maybe you will be interested in this item as an "upgrade"...the 7060A SketchPro by Hewlett Packard. It is a medium-format (11" x 11") digitizing tablet with up to 1219 lines per inch resolution, accurate to within .02" and can emulate Summagraphics Bit Pad 2 and Hitachi HDG1111B tablets, as well as a Microsoft Mouse. This allows the SketchPro to be used with most of the popular CAD and graphics programs, such as AutoCAD, Versa CAD and CADKEY. We are offering a brand-new-in-the-box tablet with pen-type pointing device, subtitute power supply and documentation for only $149.00 (list price was $599). A four-button "puck" type cursor is available directly from HP if you prefer that type of input device. We are offering a 90-day warranty on this high-quality U.S. product. If you missed the PenMates, don't miss this one!

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USER GROUPS cont.

MULTIMEDIA

Desktop Video User Group. Now forming in El Cerrito. Call: (510)528-9895. [Exp. #130.]

SEF Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Center for Software Development, 111 W. St. John St., Suite 200, Downtown San Jose. SIG of Software Entrepreneurs' Forum. Call: Ralph Gilman, (408)746-0551. [Exp. #130.]

NOVELL

Diablo Valley NetWare Users Group. Meetings: 3rd Tues., 6:00 pm, Terraces building, 2300 Contra Costa Blvd., Conference Room, Pleasant Hill. Call: Leslie or Tom, (510)825-3275. [Exp. #129.]

Silicon Valley NetWare Users Group. Meetings: 3rd Wed., 6:30 pm, Sundowner Inn, Sunnyvale. Call: (408)954-0585, x590. [Exp. #130.]

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm. For anyone interested in OS/2. Presentations, product demos, questions and answers. Call: (415)755-3124. [Exp. #129.]

OS/2 Developers SIG. Meetings: 2nd Mon., 7:00 pm, IBM, 1055 Joaquin Rd., Mountain View. Call: (510)945-7565. [Exp. #129.]

PEN

SEF Pen/Mobile Computing SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 4000 Middlefield Rd., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: Bill McAlpine, (415)348-2257. [Exp. #130.]

POINT OF SALE

Point Of Sale User Group. Meetings: 1st and 3rd Sat., 2025 E. 12th St., Oakland. Call: (510)216-9335. [Exp. #125.]

PROGRAMMING LANGUAGES

Forth Interest Group, North Bay Chapter. Meetings: 2nd Sat., 1–5 pm, tutorial at noon, 2055 Center St., Berkeley. Call: Leonard Morgenstern, (510)376-5241. [Exp. #130.]

SEF Intelligent Systems SIG. Meetings: 2nd Mon., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Leor Jacob, (415)595-5200. [Exp. #130.]

SEF Visual BASIC SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Allan Colby, (415)851-4567. [Exp. #130.]

Silicon Valley Forth Interest Group. Meetings: 4th Sat., 10:00 am–5:00 pm, 230 Lincoln Centre Dr., Foster City. Call: Dr. C.H. Ting, (415)638-5669 (w), 571-7639 (h). [Exp. #130.]

TEXAS INSTRUMENTS

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #128.]

UNIX

AT&T UNIX Computer Users Group. Meetings: 4th Wed., 6:30 pm, Location varies. Call: Thad Floyran, (408)985-7100 or Usenet: thad@cup.portal.com [Exp. #129.]

International Linux Association. Meetings: 3rd Mon., 7:00 pm, International House of Pancakes, 5403 Stevens Creek Blvd. (off I-280 Lawrence Expwy. South, next to Howard Johnson Hotel), Santa Clara. Learn/use UNIX, X-Windows, Internet through Linux. See Linux change the computing world. Call: (408)369-9818, email alte@rahul.net . [Exp. #130.]

SEF UniForum Open Systems SIG. Meetings: 2nd Tues., 7:00 pm, DEC Auditorium, 130 Lytton Ave., Palo Alto. A special interest group of the Software Entrepreneurs' Forum. Call: Priscilla Rowe, (415)546-4950. [Exp. #130.]

VIDEO TOASTER

Bay Area Video Toaster Users Group. Meetings: 4th Tues., 7:00 pm, Richmond Public Library, Whittlesey Room, 325 Civic Center Plaza, Richmond. Product demos, guests, info, tips, and much more. Call: Don Smith, (510)620-6759. [Exp. #130.]

Video Toaster User Group. Meetings: Last Thurs., 7:30 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, plus info/tips on new System 3.0. Call: Andrew Timmins, (408)243-9233 (eve.). [Exp. #126.]

WINDOWS

SEF Windows SIG. Meetings: 1st Wed., 6:30 pm, Cubberley Community Center, Room H-1, 4000 Middlefield Rd., Palo Alto. SIG of the Software Entrepreneurs' Forum. $10 for nonmembers. Call: Fran Finnegan, (415)288-4400. [Exp. #130.]

WIRELESS

SEF Wireless SIG. Meetings: 1st Mon., 7:00 pm, Center for Software Development, 111 W. St. John St., Ste. 200, San Jose. A special interest group of the Software Entrepreneurs' Forum. Call: Patrick Glenn, (408)448-3844. [Exp. #130.]

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ASSOCIATIONS

American Association For Artificial Intelligence. Meetings: Individuals interested in learning about the use and application of AI. Call: (415)328-3123, fax: (415)321-4457, email: membership@aaai.org [Exp. #126.]

The Assembler Multitude. Meetings: every 3rd week on Mon., 7:30 pm, University Lutheran Church, 1611 Stanford Ave., Palo Alto. An open discussion of new technical developments in many fields and how they relate to nanotechnology. Call: (408)974-6241. [Exp. #130.]

The Association For Customer Support Professionals (ACSP). Meetings: Quarterly. Dedicated to the development and furtherance of customer support as a distinct profession, to the growth of the support community, and to the improvement of support service. Call: (510)865-4515. Email: tao@well.sf.ca.us or 71333,2116@Compuserve.com [Exp. #126.]

Association For Women In Computing. Meetings: 1st Wed., 6:00 pm, Sinbad's Restaurant, Pier 2, San Francisco Embarcadero. $15 members, $20 guests. Call: (415)979-8450. [Exp. #128.]

Bay Area Video Coalition. A place for independent videomakers to communicate with each other and the larger media community. $10 for nonmembers. Call: Anne Etheridge, (415)861-3282. [Exp. #128.]

Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thursday, 6:30 pm, Amdahl Corp., Bldg. H, 1240 E. Arques Ave., Sunnyvale. National network of DP professionals, educators, students, and vendor reps. Call: Willie Mackey, (408)280-7624. [Exp. #128.]

Business Marketing Association. Meetings: 4th Wed., 11:30 am, Marriott Hotel on Great America Pkwy., Santa Clara. A professional organization for business-to-business marketing professionals; CBC certification, topical programs, seminars, job bank. Call: (408)365-9815. [Exp. #127.]

Computer Professionals For Social Responsibility/ Berkeley Chapter. Meetings: last Sun., 2:00 pm, BMUG Offices, 2055 Center St., Berkeley. Meetings are open to the public and free. Call: (510)987-0567 or cpsr-berkeley@cpsr.org . [Exp. #130.]

Foresight Institute. Meetings: 123 Fremont Ave., Los Altos. Information about and discussion of nanotechnology and other anticipated technologies. $35 annual membership. Call: (415)917-1122. [Exp. #130.]

Historical Computer Society. 10928 Ted Williams Pl., El Paso, TX 79934. A nostalgia group for enthusiasts of older computers and their history. Main forum is *Historically Brewed* newsletter; $18/yr., $3 sample. Call: David A. Greelish, (915)822-2683. [Exp. #127.]

Independent Computer Consultants Association, Northern California Chapter. Meetings: Dinner: 2nd Tues., 6:00 pm; Breakfast: 4th Thurs., 7:30 am; The City Club, 155 Sansome St., San Francisco. Open discussion, questions and answers. Call: (415)399-0305. [Exp. #130.]

Nanosystems Study Group. Meetings: every few months, 7:30 pm, Genentech Conference Center, Bldg. 5, South San Francisco. Call: Ted Kaehler, (408)974-6241. [Exp. #130.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:00 pm networking, 7:00 pm dinner, 8:00 pm speaker. Embassy Suites Hotel and Conference Center, 101 McInnis Parkway, San Rafael. NBSP provides a forum for systems professionals to grow and to benefit from a network of other like professionals. Call: (415)721-4409. [Exp. #130.]

Robotics Society Of America. Meetings: 1st Mon., 8:00 pm, Exploratorium Library. Call: Brad Smallridge, (415)550-0588. [Exp. #128.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed., 6:00, program at 7:00 pm. Stagecoach Restaurant, 44 Montgomery St., San Francisco. For technical writers, editors, and other technical communicators. Some meetings are dinner meetings, for which reservations are necessary. Call: (415)985-7121. [Exp. #127.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. 5:30 pm refreshments, 6:30 pm dinner, 7:15 dessert. Sunnyvale Hilton, 1250 Lakeside Drive (off Lawrence Expressway at 101). Guest speakers, special interest groups, networking, job listings, newsletter. Call: (408)737-9426. [Exp. #127.]

Software Entrepreneurs' Forum. 3rd Wed., 6:30 pm, Elk's Lodge, 4249 El Camino Real, Palo Alto. Industry association dedicated to software developers and entrepreneurs, offering information and education on all facets of the software industry. Call: Barbara Cass, (415)854-7219. [Exp. #130.]

BULLETIN BOARDS cont.

bytes of files, online shopping. Sysops: Gary Ray & Jeff Macko. [Exp. #127.]

VA Listings. (510)637-1261. 24 hrs., 300–9600. Multiline. VA-owned homes for sale. Sysop: David Piersall. [Exp. #127.]

Windows Online. (510)736-8343. Largest Windows BBS, members receive free Internet mail, thousands of files. Free limited trial. [Exp. #126.]

Wishing Well BBS. (510)745-7901. 1200/14,400. 85+ online games, quality files, ANSI art, RIP graphics, matchmaker, and more. Sysop: MaryLou White [Exp. #126.]

707

Games People Play BBS. (707)746-6873. 2400–14,400. Games, Windows, and doors. Immediate access to files. Free. [Exp. #127.]

The WINd Tunnel BBS. (707)421-0380. 24 hrs., 2400–14,400. Great source for Windows programs, large collection of DOOM files. Free and fee. Sysop: John Wright. [Exp. #127.]

714

CWI-BBS. (714)870-1033. Entire CWI Disk Catalog plus six CD-ROMs. Free 30-min. browse. [Exp. #126.]

916

24th Street Exchange. (916)448-2483. 8-N-1, 24 hrs., 300–28,800. 27 lines, 21 CDs, FidoNet, USA Today, PC catalog, Internet email, chat. [Exp. #125.]

Pacific Exchange (Major) BBS. (916)965-0313. 8-N-1, 24 hrs., 2400–14,400. Eight lines. 35,000 files, 5GB, look for the Free stuff. $25/year. Sysop:

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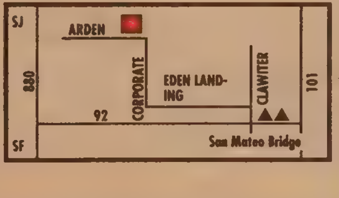

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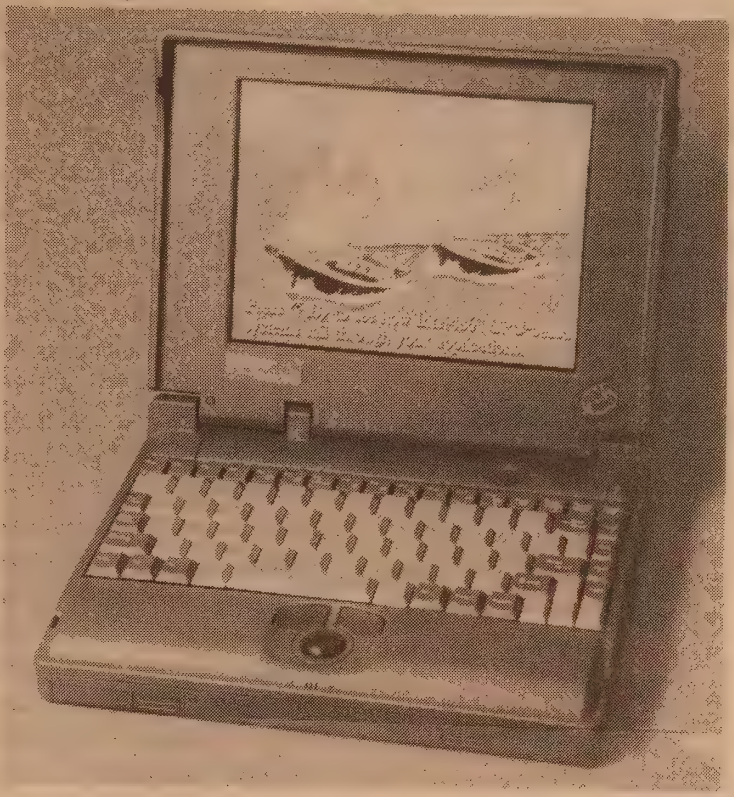

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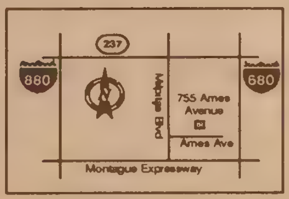

continued from page 102

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EVER SINCE I FIRST STARTED HANGING OUT ONLINE, PEOPLE HAVE BEEN SAYING, "WE'D REALLY LOVE IT IF ALL THE MICROTIMES ADS WERE AVAILABLE IN DIGITAL FORM FOR US TO SHOP THROUGH. THAT WAY WE COULD CALL UP ALL THE PEOPLE THAT ARE OFFERING 486S AND JUST PRICE-COMPARE THEM AND GO OFF AND BUY FROM THE CHEAPEST ONE." WHICH OF COURSE IS UNDESIRABLE FROM SOME ADVERTISERS' STANDPOINT, BECAUSE THE PC UNIVERSE IS JUST COMING OUT OF THIS PRICE WAR WHERE EVERYBODY WAS UNDERCUTTING EACH OTHER TO A SUICIDAL POINT.

Suicidal price wars have their natural terminus. [*laughs*]

YES. THE PC TONTINE...

They're going to have to deal with that.

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That's right. But if the vendor really doesn't offer any added value beyond delivering the lowest price, they shouldn't be in business and won't be, and so there will be other ways to differentiate your product than merely hoping that the reader doesn't have access to full knowledge of available prices.

There are a lot of little anomalies as you move through this transitional era, but I think the direction is pretty clear.

DO YOU THINK THAT READERS ARE GOING TO GET SMARTER AS A RESULT OF THIS IN TERMS OF FILTERING INFORMATION FOR THEMSELVES, OR ARE THEY JUST GOING TO BE EVEN MORE DEPENDENT THAN THEY ARE NOW ON UNSEEN FILTERS BACK AT CBS? I FIND RIGHT NOW THAT AUDIENCES ARE EXTREMELY NAIVE ABOUT THE SOURCE OF THE INFORMATION THAT THEY JUST GOBBLE. I WONDER IF YOU SEE THAT CHANGING.

Yes, I do. Unseen filters back at CBS will have greatly reduced power. The editors who actually have them in mind and understand them will be able to deliver information to them, but there will be no advantage in being CBS. Controlling a conduit will not impart any power over content to the vendors of information. In other words, all content providers will be created equal, and that will mean that providers of the content that's really relevant to some person will win that business.

ONE OF THE HOT SUBJECTS OF DEBATE ON THE INFORMATION SUPERHIGHWAY IS THAT A LOT OF PEOPLE ENVISION THE RICH GETTING RICHER, THE POOR GETTING POORER, AND THE GAP WIDENING BETWEEN THE PEOPLE WHO HAVE ACCESS TO THE TECHNOLOGY AND THE PEOPLE WHO DON'T. DO YOU THINK THAT IS WHAT WILL HAPPEN?

No. This technology is supremely cheap and supremely distributed, and what it does is greatly enhance the power of individuals. Because it will be ubiquitously available, it will actually reduce a lot of the gaps, the sort of artificial divisions that currently leave some communities as backwaters and make others rich with cultural features and opportunities.

These technologies will give to every person at a workstation the creative power of a factory tycoon of the industrial era, the communications power of a broadcast tycoon of the television age.

The biggest benefits will come to previously bypassed communities in the boondocks or ghetto communities in the inner cities. Now in order to get a good school, you've got to live in a rich community, but with broad-band information seas or whatever, you'll be able to get the best education regardless of where you are. I think the benefits to poor people will be substantially greater than to the current beneficiaries of suburban advantages.

I really don't agree with that whole info-rich/info-poor picture. It's the biggest menace to the future of the technology, because it leads to a lot of government intervention and manipulation and exploitation that is mostly perverse, that just retards its development. Fears like that are resulting in the re-regulation of the cable industry.

Other fears are that these technologies will destroy employment opportunities, and it's just complete nonsense. People don't get employed because they're cheap. They get employed because they're productive. These technologies are productivity tools, and by making people more productive, they make people more employable. By generating wealth, they endow new work.

Most of the fears about these technologies are completely contrary to the facts. They completely misunderstand the most essential characteristics of the technologies they're criticizing. In any society you get paid for your services to others, essentially, and if you aren't willing to make any efforts to serve others, if you expect the society to support you regardless of the value of what you do…

A gap will open between the productive and the unproductive in any society. As the society becomes richer, it will probably be easier for some people just to opt out, you know, and just essentially subsist on leftovers. But that's a decision that they make. I mean, if they want to opt out, then they can't expect to share in the largest rewards of the economy. What's really tragic is when the government actually pays people to opt out, makes opting out more profitable than actual engagement and productive services. That is a real problem in the inner city today.

I don't think technology widens the gap—it creates all sorts of new kinds of work. The industrial era actually did try to reduce workers to kind of accessories of the big, centralized, mechanical systems they served. The computer age endows individuals with greater creative capabilities. It multiplies opportunities and careers and jobs.

DO YOU SEE THE CURRENT ADMINISTRATION BEING BENEFICIAL OR HARMFUL IN ITS TECHNOLOGICAL POLICIES, OR IS IT TOO SOON TO TELL?

I think so far it's been destructive. I hope in the future it sees the light. But so far they're all obsessed with the information-rich and the information-poor, thus revealing that they belong to the latter group. [*laughs*]

The idea of creating a new PCS system and having all sorts of spectrum set aside for companies owned by women and minorities and handicapped and other groups—it's just a mistake. It just favors the cynical people who create spurious companies owned by their wives to bid for the spectrum.

Trying to inflict universal service prematurely is a great mistake. The rich always use technologies, overpay for technologies in the initial era before they're perfected. That's how the initial development costs are defrayed. To artificially require that some technology be distributed more widely before it's ready will just limit its penetration.

People keep pointing to the phone company's model of universal service. Well, it took fifty years for the phone companies to deliver universal service, and there's very little evidence that any regulatory requirement was very important in this process. It probably would have happened more quickly if the gov-

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ernment hadn't essentially enforced these monopoly franchises and required them in exchange to extend universal service.

There's no requirement of universal service in the television industry, yet today television has 98% penetration to homes and telephone industry has about 94% with its universal service requirement. Television did it in forty years rather than in seventy years or whatever.

Most of these industrial policies do not work, and the administration is infatuated with them. I think it's bad for technology, and what really benefits technology is lower tax rates. It allows more capital to be accumulated by individuals who can directly invest in technology companies. Technology companies are complex and hard to finance. What you want is disposable personal capital to finance technology, people who really understand the project and thus won't panic when there's a setback—they actually understand the technology well enough to carry it through crises and setbacks that are inevitable in any difficult business project.

> Sixty percent of the computers that are being sold today go into homes and home offices, small offices. This growth in homes and home offices is about ten times the rate of growth of TV sales.

So what you want is lower tax rates, and the administration above all else is committed to increasing tax rates. That's more significant than all their industrial policies. But the industrial policies, as manifested by the Cable Act and other additional regulations imposed on cable, and their increasing itch to manipulate the phone industry, and their increasingly baleful eye on the computer industry, are so far destructive.

SO WHAT DO YOU THINK ABOUT CLIPPER?

I think Clipper is a premature standardization. It's not perfected, it's not simple, it's not cheap, it's not effective, and so it shouldn't be adopted.

In general, my sense is that encryption technology is in an area of very dynamic advance at the moment. There are all sorts of new solutions being adduced, and it's just a mistake to fix on one technology at this juncture.

I do think that the problem they're addressing is a real problem, that terrorism and other such crime is a real threat and the National Security Agency is in some sense in an arms race with nuclear renegades and terrorists, bioengineers or whatever, and they're going to have to use lots of new technology to meet this challenge. But they're not going to have a sort of one-size-fits-all magical chip that will solve their problem.

I don't think there's an easy techno-fix to it as the Clipper people seem to imagine. As somebody said, if encryption is outlawed, only outlaws will have encryption, and that's really the implication of the Clipper strategy.

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Data Highway *continued*

From a competitive standpoint it's bad also, since you can get perfectly good robust encryption from foreign vendors all over the world—I was reading an article not long ago where US vendors were saying, "Okay, fine, we're just going to build factories overseas and do all our crypto stuff there to avoid all these regulations because we just can't compete."

Well, I think that kind of thing will happen.

My view is that the government will have lots of new technologies that will allow it to eavesdrop on people it wants to eavesdrop on. And they may not consist in being able to read any transmission from some central point, but I don't think the Clipper chip would result in that kind of capability.

There is a longing by government for a static world, and this isn't a static world. Entrepreneurs constantly have to adapt to new environments, and government will have to get more entrepreneurial if it's going to protect us from these threats.

I do believe that there are lots of technologies. You can record things from all sorts of different remote positions and plant speakers in radios all over the place. I think they should be able to figure out how to chase the bad guys without ensnaring all the good guys in the computer industry in the process.

Privacy aside, you mentioned earlier encryption as a tool for protecting intellectual property. Where do you see that going?

There's a company called Wave Systems in New York that has developed encryption/decryption code that allows the essential metering of information. You could, for example, put hundreds of software packages on a CD-ROM and distribute them free, and charge only when you decrypted one of the packages. Parts of the package could be usable for a specific period of time, or some limited portion of the software could be accessible, but in order to get the entire package you'd have to decrypt it. When you decrypt it, its price, which was on a tag, would drop into a memory that could be reachable over phone lines to debit an account that you have.

That's one way to charge for software. It also would work on networks, to charge for information—you only pay when you decrypt the entire item.

I think that kind of process will be vital to increasing the market for information, because you can charge per piece rather than for bandwidth or for whole libraries or large collections, and people will get the information they want when and how they want it, and they'll pay more by that means.

So I think that encryption will be very important in the distribution of all forms of intellectual property in the next era, and I think that's one of the reasons why to throw a sort of a Clipper chip in the middle of it is probably not so helpful. Although I'm not sure that Clipper would actually interfere with this further level of encryption that would be applied to these systems.

Peter Sprague, who is the new chairman of National Semiconductor, said that today if you want to get a glass of water in an information world, you have to buy the reservoir, or at least rent it. This technology will allow you to pay for your glass of water; this will mean that a lot of databases that are only currently accessible at very high cost can be just made generally available.

Nobody could afford to buy the CD-ROM of six hundred big books you can put on a CD-ROM. Nobody could afford to buy the six hundred big books. But this kind of an encryption/decryption metering process would allow you to distribute information free and then charge for its use. That is a major breakthrough, and very important to the whole future of the information era. ■

Windows Utilites...

continued from page 140

unsaved document files in the event of a system crash.

If you're running Windows, and experience a power failure, the CPR program can restore your programs to the screen after a reboot, letting you clean up your unsaved work. Central Point cautions that this trick is not foolproof. It will actually work about 80% of the time. (They also point out that before CPR there was no chance at all to rescue unsaved data after a crash or power outage.)

I tested CPR with complicated Windows and DESQview configurations: multiple programs and documents open. I found that after a reboot, CPR did indeed reconstruct the state of the system well enough to save work, close applications, and exit gracefully.

RAMboost, a better DOS memory optimizer than Microsoft's MemMaker, is another useful PC Tools Pro feature. RAMboost works in conjunction with any common PC memory manager (Microsoft's HIMEM, Quarterdeck's QEMM, Qualitas's 386MAX, or Helix's Netroom). It examines your DOS startup files and automatically loads drivers and programs above 640K. Unlike most memory optimizers, RAMboost does this in a single pass, and without cluttering your CONFIG.SYS and AUTOEXEC.BAT with "load high" commands. IBM liked RAMboost well enough to license it from Central Point and include it as an integral part of its PC DOS 6.1 and 6.3 operating systems.

PC Tools Pro for DOS also includes the popular Central Point Backup program; an excellent File Manager/DOS shell; anti-virus protection; screen savers; a multiple-format file viewer; a remote file transfer utility; and a number of diagnostic, data recovery, and disk maintenance modules. The PC Tools data recovery/disk utilities are competently implemented, but my gut feeling is that the ones in Norton Utilities are a little bit better.

A good rule in deciding which package is right for you is that the PC Tools products generally offer a wider range of functionality and features. But Norton is state-of-the art at the things it does best. ■

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RESOURCES:

Norton Utilities v8, $179 ($99.95 for registered users of other Symantec products, $49.95 upgrade from previous versions of Norton Utilities)
Norton Desktop for Windows v3.0, $179 ($99.95 for registered users of other Symantec products, $49.00 upgrade from previous versions of Norton Desktop)
Symantec Corporation
10201 Torre Ave.
Cupertino, CA 95014
1-800-441-7234, (408)252-3570

PC Tools for Windows v2
PC Tools Pro for DOS v9, each $179.95 (upgrade from any previous PC Tools or Norton product is $49.95)
Central Point Software, Inc.
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PENTIUM -90/256C VLB	318	998	Call	Call	Call	Call	Call	1,638	1,688	1,728
PENTIUM -66/256C VLB	198	818	Call	Call	Call	Call	Call	1,458	1,508	1,548
PENTIUM -60/256C VLB	198	678	Call	Call	Call	Call	Call	1,318	1,368	1,408
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486DX2-66C VLB	74	298	438	688	728	818	868	938	988	1,028
486DX2-50C VLB	74	228	378	618	658	748	798	868	918	958
486DX-40C VLB	74	204	348	594	634	724	774	844	894	934
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486DX-40C ISA	64	198	344	588	628	718	768	838	888	928
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486SX-33C ISA	64	138	288	528	568	658	708	778	828	868
486SX-25C ISA	64	124	264	514	554	644	694	764	814	854
386DX-40/64C	N/A	82	219	472	512	602	652	722	772	812
386SX-40	N/A	56	209	446	486	576	626	696	746	786

* **BASIC SYSTEM CONFIGURATION:** Motherboard & CPU, 1MB memory installed, 1:1 2HD/2FD controller with 2S/1P/1G, 1.44MB Floppy Drive, Internal Clock/Calendar, Enhance Case with Power Supply, and 101-Key Enhanced Keyboard.

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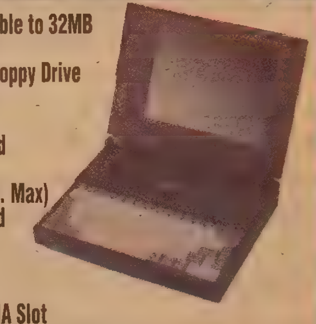

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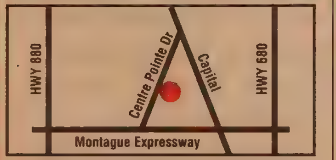

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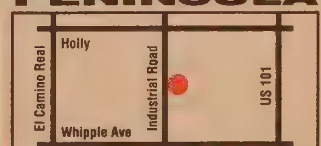

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every seat, anyway? I've heard of one fellow hooking a modem to a skyphone with a coupler and tape. I suppose you could use a radio link, if the captain didn't object. But a ground link for the aircraft network shouldn't be that hard to do.

Subversion And Secrecy

Networks are subversive. They destroy the pyramids of power corporations have constructed for decades, thus making hordes of middle managers redundant or in need of radical retraining. They permit workgroups to form as needed for the project at hand, and among workers not necessarily of the same geographical location, salary level, or company. Once information is online it travels very fast and is much easier to find, so secrecy as a management tactic doesn't work well.

> **Some people take to a networked environment like a bird to the air. Others take to it like a fish out of water. Many people fear they will be the latter and don't take to it at all.**

Corporations are not the only kinds of organizations that are affected. For example, are universities as needed when the online library is distributed worldwide, and your research colleagues are, as well?

Networks also break the oligopoly of the traditional press. No longer do you have to accept all your news being filtered by a talking head on TV to fit in between the opening automobile accident and the sports. No longer do you have to accept detailed news being subject to the house style and prejudices of newspapers. You can get wire services such as Reuters or AP directly, including everything, not just what papers find fit or politically safe to print. In many cases you can go directly to the source. After CNN was thrown out of Beijing in 1989, eyewitnesses faxed out stories about tanks crushing demonstrators in Tienanmen Square and these stories were typed in, posted on computer networks, and thus immediately distributed worldwide, as events transpired. When Gorbachev almost fell in the coup of 1991 and Yeltsin was holed up in the Parliament building, electronic mail flowed in and out of Moscow even after all the traditional media had been throttled. When Scuds fell on Israel, some people on the ground had to pause to get their gas masks before continuing to converse on IRC (Internet Relay Chat) in real time with people all over the world. And on the networks you can discuss events as they happen, with interested parties wherever they are. You can use networks to influence elections by gathering crucial information and distributing it quickly to your staff, the press, and the public. In the most recent US presidential election, two of the three major candidates, including the winning one, did just that.

These networks aren't fragile, either. US forces couldn't destroy Saddam Hussein's command and control network. Turned out it was built using the same kind of technology as the Internet. If one segment was damaged, it just routed around it. If one segment of the worldwide Matrix of communicating computer networks is damaged by censorship, the rest just routes around that, too.

Fear And Sarcasm

Some people take to a networked environment like a bird to the air. Others take to it like a fish out of water. Many people fear they will be the latter and don't take to it at all.

That, I think, is the source of this virtualization of networking: fear. Fear of not being able to cope with something that appears so strange. The same fear that accompanied the appearance of the personal computer. Fear of being laughed at, or left behind, or losing one's job. Ironically, fear is the one thing that keeps the most people from learning how to use networks and thus lose the object of their fear.

Oh, I'm sorry, irony is near to sarcasm. And sarcasm is one of the things that really gets people on edge about networked communicatons. It's not only not filtered for content like television news, it's also not filtered for means of expression. If somebody uses words you don't like, in general you can't force them not to! And the TV doesn't talk back if you criticise it. People on computer networks do. Plain ASCII electronic mail, the least common denominator of online communication, is a thin screen indeed between people compared to the one-way glass of television and newspapers.

Play, Necessity, And Familiarity

What will bring more people to use networks? Peer pressure, fascination, games, and economic or social necessity. I've noticed an increasing number of parents getting online access for themselves so they can correspond with their offspring in college, for example. As networks become more widespread, their uses will become more apparent to more people, and they will become about as feared as the telephone.

Speaking of which, why does no one refer to a voice heard over a telephone as virtual? It's not the actual sound spoken by the other person, you know. It's been converted to an electrical signal, possibly digitized, and probably amplified, filtered, compressed, sliced, diced, and blended before being reconstituted as the sound waves you actually hear. It may be a remarkable simulation of the original, but it is not the real thing: it is virtual in a very literal sense. Why don't we call it that? Because we are all familiar with it.

Earlier technologies probably suffered from the same fear. The ancient Greeks thought the increasing popularity of writing was a bad thing because people would forget how to memorize. They were right; who can recite the Odyssey these days? Yet writing made a lot more information available.

Alphabetic scripts probably had a hard time when they were first introduced. Imagine a scribe required to learn one of them. "At least with hieroglyphics it's obvious what the word means by what it looks like!"

People fear unfamiliar technology. They pick words to trivialize it or stigmatize it, hoping that will make it go away. It rarely does. ■

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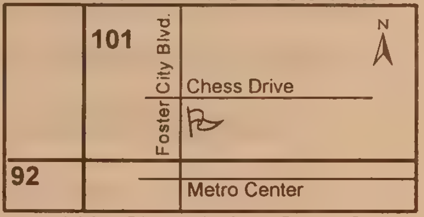

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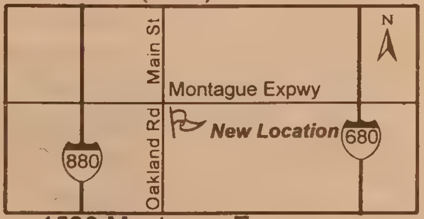

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Wireless Communications...

continued from page170

rity across both wired and wireless networks. NSC entered the fray with a new technology called "iPower" that delivers the highest level of personal, portable data security commercially available, even across unsecured networks, at a low cost.

iPower technology uses an impenetrable hardware-based access card known as a "token" for securing and processing secret keys and data. Tokens provide a higher level of security than previously possible with software-only or network-based security schemes.

iPower technology secures users rather than networks. It can be implemented on any type of network, whether wired or wireless. The first implementation is housed in a PCMCIA Type II card that is assigned to a specific user. To activate the card, the user plugs it into a PCMCIA card reader and enters a validation code. After the card and code are acknowledged, the system enables the user to send and receive information that is secure, across unsecured as well as secured networks.

The iPower system integrates advances in three critical technologies: semiconductor, networking, and encryption. It has been designed to be fully compliant, and is built on industry standards such as the PCMCIA Type II specification and DEC, RRS, DESX, RC2, RC4, PKCS, CCITT, X.500, and X.509 encryption and transmission standards.

> **PC users owe a lot to the Macintosh. Whatever changes that have occurred on the PC side are a result of a trail blazed on the Mac.**

Since the iPower system is designed to be used in conjunction with PCMCIA slots, NSC announced a desktop PCMCIA reader/writer device for those who do not yet have PCMCIA capability. The system itself is housed in a Type II card and contains a high performance, 32-bit microcomputer, several embedded powerful cryptography engines, and long term non-volatile data/algorithm memory.

This combination enables the system to provide positive identification and authentication (certificates) through public key crypto technology, message privacy through block-encryption, secret key exchange, message verification, and non-repudiation (digital signatures). It also provides for secure storage of secret keys, algorithms, and personal and transaction data.

The National Security Agency is mandating personal, portable tokens for future U.S. government agency access to the new data highways. The combination of data security provided by the NSC system meets or exceeds all present and future government specifications, and yet it is easy to use and totally secure. These new PCMCIA-compatible tokens are called "Tessera" cards, after the token ancient Romans used as a ticket, tally, voucher, and means of identification.

iPower cards contain a special high-tech Security Processing Unit (SPU), and their circuitry is unbreakable by electrical or physical tampering. Attempting to reverse-engineer the card will result in the SPU chip becoming blank—it will not give up its secrets to anyone.

The idea is that users will carry these cards as their tokens, and access will be granted only when the proper Personal Identification Number (PIN) is used in conjunction with a card. If the card is lost, it cannot be used by another person, and it can be replaced only by the certification agency that issued it.

Using a series of encryption and public and private key systems embedded into the system, the card provides positive identification of the user; reliable system authentication of the user; hardware encryption privacy through support for DES, RSA, and other encryption algorithms; positive verification of messages to prevent alteration or transmission errors; secure authorization capability, including digital signatures for non-repudiation; and on-board transaction recording to improve security and enable off-line transactions and metering.

Private and public keys are used to send secured data that can only be retrieved by the addressee. Each person is given a public key. This key is like a phone number, and it is listed in standard network directories. When sending an encrypted message, the intended recipient's public key is used.

On the receiving end, a message can only be un-encrypted by use of a person's private key, a key that is not published and not known to anyone. (In NSC's iPower system, it is not even known to the end user or the vendor, since it is generated by the card when it is first installed.)

The DES standard is another form of encryption that is faster than the use of private and public keys, but it requires an encode-decode key to be passed between the two parties wishing to share data. While it is faster, anyone posessing the key can decode the message.

The iPower system uses both of these methods as well as a third method known as "hashing" to provide for totally secure communications while taking advantage of the speed of the DES system. With hashing, a user looks up the public key of the person to whom the message is to be sent. A random number generated by the program is then encrypted and sent to the user. This number is used as a key for a DES session. At the end of the session, a hash of a specific length that must match the hash on the receiving end is sent. If all conditions are met, and the data is sent, it can be verified that it was sent by the person who said he or she sent it, that it was received by the person for whom it was intended, and that no one else had access to it.

This system is so secure that it can be used for monetary transactions, legal documents, and other transactions that require absolute verification of transmission and reception and need to be handled in a secure way.

Putting the Pieces Together

Each one of these five pieces is provided by a different company or group of companies. The real challenge will be how to package them into an efficient, easy-to-use wireless mobile computing platform. Much of the work on this integration is in process.

The first products to take advantage of these technologies will certainly not turn out to be the do-all, end-all systems that will evolve over time. They will be the first of an entirely new generation of products that will provide another step toward realizing the promise of mobile computing.

All these advances are coming, and it is especially encouraging that most of these companies are talking to each other and realizing that a single company or organization cannot possibly provide all the necessary pieces and parts.

Realization of the wireless dream is coming closer. But much remains to be done. These five pieces of the puzzle bring the goal considerably closer. The visions of many different players and companies will need to come together into a series of common pieces and parts in order to go the rest of the way in achieving the goal. ■

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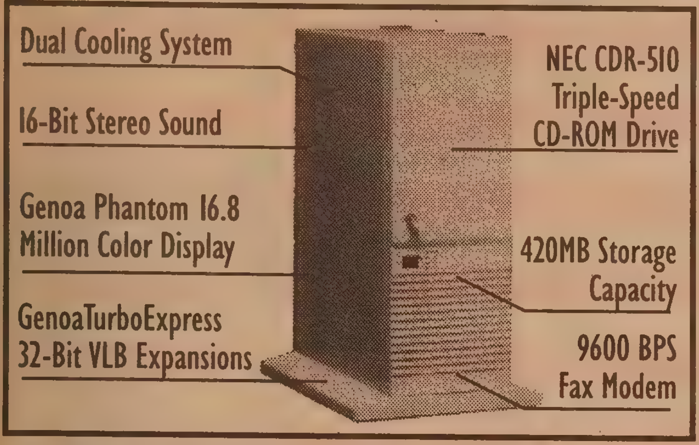
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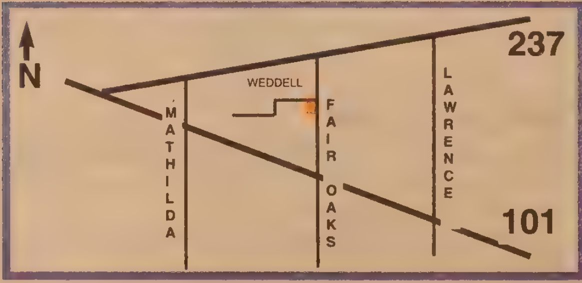

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Continued from page 212

Dynamic Effects Volume 1

Published By: Gryphon Software
List Price: $119
Reviewed By: Matthew Leeds

Premiere users can now look to Gryphon Software, past masters in Macintosh video effects, for effects plug-ins. This library of effects contains twenty plug-ins, two that provide improved versions of existing Premiere filters, and eighteen that offer new effects.

Dynamic Effects requires v2 or better of Premiere and either a fair amount of patience or a fast Mac, as some of the effects take time to process. The two improved filters (Iris and Wipe) allow you to feather the edges of two clips, creating a very smooth transition.

Several of the new filters are useful in creating an "old-time movie look." Offset Jitter simulates the movement of film in a projector. Dust adds random noise, mimicking dust on film. Luminance Jitter adds a flicker that simulates an old film projector. Duotone reduces a color image to two colors and can be used to create a sepia look.

The more interesting filters are those that create unusual effects. Channel Delay lets you delay each color channel individually, creating color ghosts wherever there is motion. Mirror splits the frame in two, mirroring one half of the frame in the other half. Room creates a 3-D box with each side showing the entire video frame.

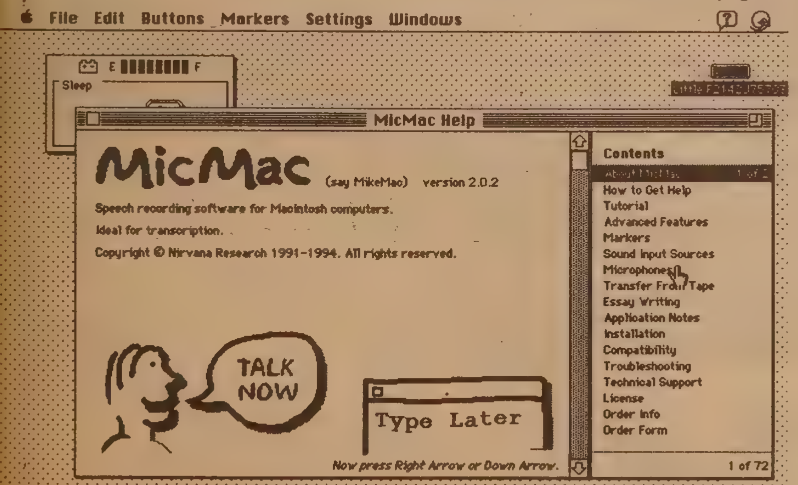
Perhaps the most interesting is Tempus, which distorts motion in the video frame based on a grayscale map. Depending on the map, you can get effects that range from the strange to the downright weird. Gryphon demos a video shot on a rotating stage, filtered with Tempus using a simple gradient map. The motion is delayed down the screen with a resultant effect that makes the actors look like twisted taffy. This package is a must for hard-core Premiere users. (Gryphon Software, Inc., 7220 Trade St., Suite 120, San Diego, CA 92121)

MicMac 2.0.2

Published By: Nirvana Research
For: Most Macs with sound input capability
Price: $89
Reviewed By: Mary Eisenhart

Probably every journalist's dream application is the self-generating

Continued on page 316



MicMac (say MikeMac) version 2.0.2

Speech recording software for Macintosh computers.

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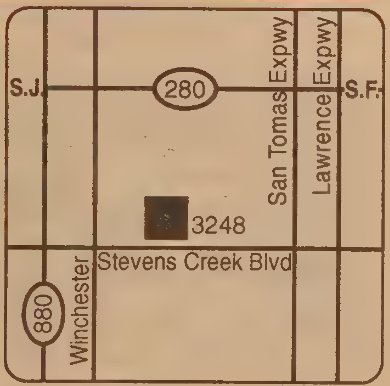

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Continued from page 313

transcript, which could be why a lot of us like doing interviews in email. Until the blessed day arrives when some speech recognition software translates your tapes into nice word processor documents, however, MicMac is a useful interim measure.

MicMac, which can be installed to run from an alias in the Apple menu, duplicates tape-recorder functions on your Mac, allowing you to record speech or transfer the contents of tapes through the microphone port. Files can be very large, e.g. interviews, or small (miscellaneous spoken notes to oneself on reviewing a document, for example). Sound can be stored on your hard drive with no compression, 3:1, or 6:1 compression, depending on your disk space and compression requirements; at 3:1, which is adequate for most transcription purposes, a two-hour interview takes about 90K.

Once the speech is saved to a MicMac file, it's easily played from the keyboard or by mouseclicks onscreen. PowerBook users in particular will find the transformation of their PBs to all-in-one portable transcription stations a major productivity enhancement, especially for those long plane flights.

A particularly nice feature is SkipBack, which rewinds the virtual tape for a designated number of seconds. Another nice feature is that MicMac keeps track of how much space remains on your disk, and reports it to you as available recording time.

You can use MicMac to record in the background as you work in other applications. One caveat on this: on my PowerBook 170, using the internal modem while recording results in the sound cutting off from the microphone jack. Author Leo Baschy says the probable cause is crosstalk among the tightly packed electronics inside the PB; in any case, if I remember not to log onto any systems while I'm recording, it all goes smoothly.

There are a few other compatibility problems associated with different Mac models, particularly the AVs; check with Nirvana (which is constantly adding improvements and bug fixes) about your particular configuration.

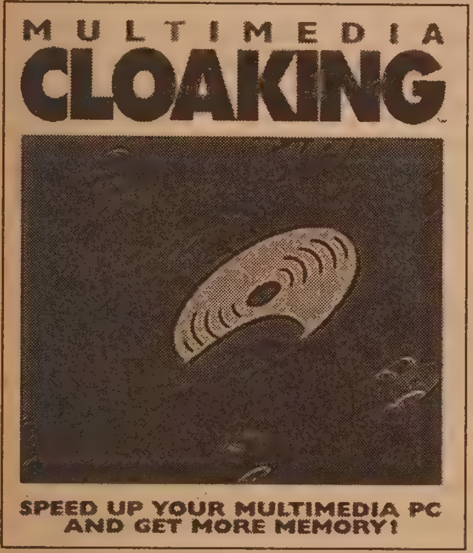
While you can achieve fairly presentable sound quality even with the bundled Mac microphone, you'll do better with higher-quality ones. MicMac is not intended for professional-quality music recording, but for keeping spoken notes and other info on your computer for later use. It's a very useful tool and highly recommended. (Nirvana Research, 1-800-525-3888; nirvana@cup.portal.com)

PC Software Utilities

Multimedia Cloaked Utilities

Published By: Helix Software
List Price: $39.95
Reviewed By: Lenny Bailes

Now that MS-DOS programmers have extracted pretty much all of the added memory we're ever going to get from the "loadhigh" features of the first megabyte, Helix Software has opened a new approach to memory management with its Cloaking Technology. The Multimedia Cloaked Utilities can gain users another 64K to 96K of conventional memory above and beyond what is achieved by loading drivers and TSRs into upper memory.



The Cloaked utilities consist of substitutes for Microsoft's CD-ROM extensions, Smartdrive disk cache, and standard mouse drivers. Instead of transferring the 60K to 96K overhead of these necessary programs to memory between 640K and 1MB, Helix has developed a Protected Mode interface that places them in extended memory, entirely out of the first megabyte. The package will work with any standard memory manager, including the modules that ship with MS-DOS 5 and 6, Novell DOS 7, Quarterdeck's QEMM, Qualitas's 386MAX, and Helix's own Netroom. The Cloaked Utilities have a simple, automatic installation procedure that allows you to cus-

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80C287-12 MHz	35
80387SX-16,20,25	69
80387DX-16,20,25,33	75
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3167-20 20 MHz (Tube)	$29
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4167-33 MHz	300
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83D87-33 33 MHz	29
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80C387SX-25	29
80C387SX-33	29
8C387DX-20	29
8C387DX-25	29
8C387DX-33	29
8C387DX-40	29
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US 83C87 25/33 MHz DX	29
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4 MB	121125-002	225
Contura Lite 20/25		
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4 MB	129769-002	245
8 MB	129769-003	395
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4 MB	107653-001	310
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EBD	167811-001	225
SLT 386		
2 MB	118304-001	135
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Deskpro 386S (E. Board)		
4 MB	11364-001	255
4 MB	112534-001	189
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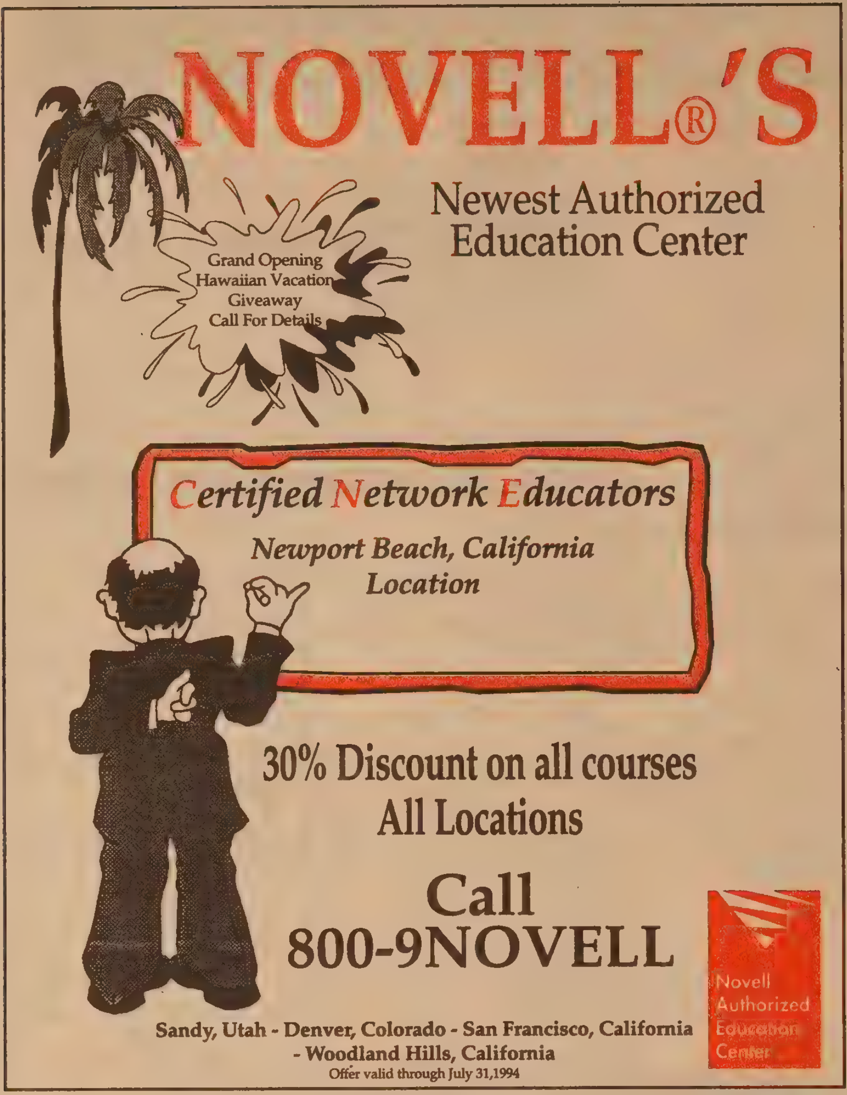
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tomize the replacement drivers, or use a series of standard "smart settings."

Helix's CacheCloak has all the capabilities of Microsoft's Smartdrive disk cache. It leaves a resident stub of less than 5K in conventional memory, no matter how large you make the cache. CacheCloak delivers faster performance than Smartdrive, and is also capable of caching multiple CD-ROMs. Helix's multimedia substitute for Microsoft's MSCDEX lets you assign specific drive letters to multiple CD-ROM drive units. If you don't want to use the CacheCloak program, the Helix CD-ROM extension contains a separate built-in cache. The mouse driver was designed by Logitech and is fully compatible with all Microsoft and Logitech mouse types. MouseCloak contains a series of advanced customization features that control mouse speed in various screen resolutions.

When I installed the Cloaked Utilities with QEMM as my memory manager, it moved 89K of resident drivers and TSRs out of the first megabyte and into extended memory. Users of Helix's Netroom may experience a slightly smaller memory gain, since it already uses Cloaking technology and the extended memory disk cache. The package also contains Discover, a memory inventory utility similar to Quarterdeck's Manifest. Discover has a useful memory-viewer that allows you to view a hexadecimal dump of any specified memory address in the first megabyte.

The Helix replacements for the standard Microsoft drivers all performed flawlessly on my system. For $39.95, the Multimedia Cloaked Utilities are a must-buy for anyone who is looking for more DOS conventional memory, or a faster DOS disk cache. (Helix Software, Inc., 47-09 30th St., Long Island City, NY 11101. 1-800-451-0551)

Star Trek Screen Posters

Published By: Berkeley Systems
For: Windows or Macintosh
Reviewed By: Woody Liswood

The Berkeley After Dark screen saver engine has another set of images from the original Star Trek images to display as part of your Windows or Macintosh screen saver adventures. (The Windows version is reviewed here.)

Unlike the first Star Trek screen saver from Berkeley Systems, these are not movies, nor do they talk or have other sounds. Included are forty pictures from some of the best episodes, along with a few junky advertising type images I quickly removed.

In addition to working as a screen saver, these pictures can also be converted into Windows wallpaper files.

If you are a Star Trek fan, as am I, this is a must product. After looking at the Star Trek Screen Poster images, you will probably want to check out the original movie adventures of Star Trek. This is a screen saver I recommend always having around. (Berkeley Systems, Inc., 2095 Rose St., Berkeley, CA 94709. 510/540-5535)

PC Hardware Utilities

UltraStat

Manufactured By: UltraStat
List Price: $59.95
Reviewed By: Woody Liswood

Static electricity is your worst enemy. Walk across the room, touch the keyboard, and watch your computer freeze up. I've even burned out keyboard chips this way. Does your display screen have more dust and dirt on it than your car window? This is caused by the static electricity generated from your display grabbing every bit of dust it can find. If you doubt this, just run your hand across your screen while your monitor is on.

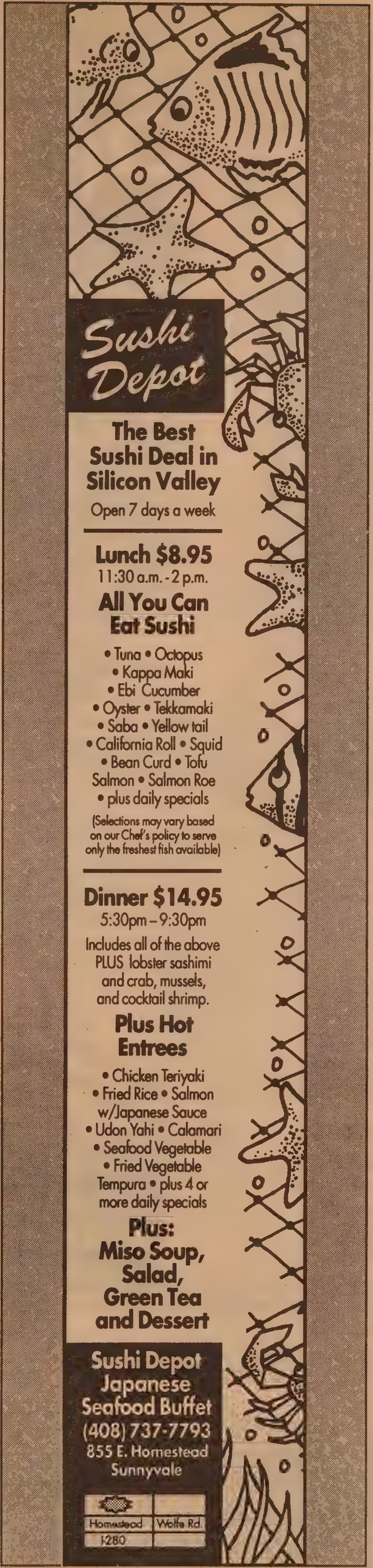
UltraStat, and Ernie, work wonders in doing away with static problems. And, they work together in a rather fun way.

UltraStat is a device that sits atop your display screen. It has a little display area where Ernie appears when UltraStat is in action. A metal arm reaches down from this device and touches your screen. There are two cables in the back. One goes to your keyboard, where a small rubber-like mat covers your spacebar. The other hooks directly to the grounding plug of your three-prong plug.

Attach the cables, then coat and clean your screen with the fluid that comes with UltraStat and you are all set.

Whenever you turn your computer on or off, Ernie leaps into the display area to show that you are discharging static electricity from your screen into the ground. Walk across the rug, touch your spacebar, and if you are carrying any static electricity, Ernie again leaps into view as you discharge into the ground.

I put UltraStat on my computer just before we started a major remodeling job in our kitchen. Thanks to UltraStat I did not pick up any dirt on my screen during the project. Before Ernie began the protection, I had to clean my screen at least once a week. This is a great device. (UltraStat, Inc., P.O. Box 791, Colorado City, CO 81019. 1-800-460-STAT) ■



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* PowerBook is a trademark of Apple Corporation
* SoundBlaster is a trademark of Creative Lab

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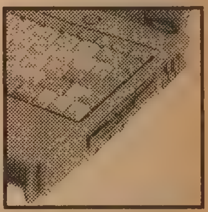
This is what the review have to say about the Wedge ShowBOOK...

PC MAGAZINE

> ***"The unit's overall performance on our tests was very good. The ShowBOOK ranked in the top five in all tests... The ShowBOOK's standard local-bus video came through to secure the top Graphics WinMark score of 4.6 million pixels per second..."***
>
> *- PC Magazine, Dec 21, 93*

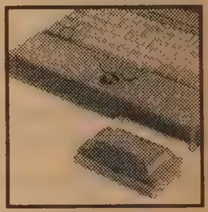
...Wait and see what they will say about our **Enhanced version**.

Multimedia...



Add sound excitement to your presentation or work with recorded WAVE or MIDI files. With additional software, the ShowBOOK 4E can incorporate Voice Recognition.

Hot Swap Batteries...



The standard two rechargeable NiMH battery packs allows for hot-swap of any unit without turning the notebook off. This feature allows for uninterrupted battery usage.

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PC MAGAZINES TOP CHOICE DECEMBER 1993

PC MAGAZINE

TOP CHOICE

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PC Magazine, Dec. 21, 1993

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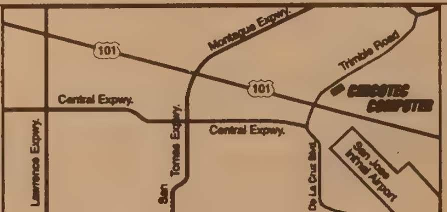

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GXE64 2MB DRAM Power Pac S/W VLB/PCI	259
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GXE64PRO 2MB VRAM Power Pac Plus VLB/PCI	539
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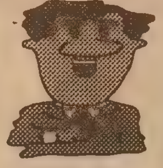

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SuperMicro P60/P66 PCI/EISA 256K	Call
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Enterprise IV, 486DX-33, 256K, CPU	Call
Enterprise IV, 486DX2-66, 256K, CPU	Call
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386DX-40 ISA w/128K & CPU	$99
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Cyrix 486DX-40Mhz	Call
Cyrix 486DX2-50Mhz w/HeatSink	Call
Cyrix 486DX-50Mhz w/HeatSink	Call
Intel 486DX-33Mhz	Call
Intel 486DX2-50Mhz	Call
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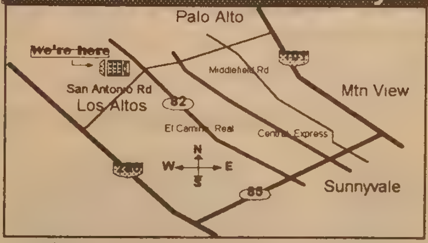

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Genoa 8500 VLB w/1MB	98
Diamond Speed Star Pro VLB w/1MB	108
Diamond Stealth 24 VLB w/1MB	138
Diamond Stealth 32 PCI w/1MB	168
Diamond Viper VLB/PCI 2MB VRAM	305
Orchid Fahrenheit 1280 Plus w/1MB (ISA)	138
Orchid Fahrenheit VLB w/1MB	138
Orchid Kelvin 64 Bit VLB/PCI w/1MB	338
ATI Graphics Ultra Pro VLB/PCI w/2MB VRAM	269
ATI Turbo 64 PCI VLB w/2MB VRAM	335

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Nanao F340iw 1024x768 0.28mm dp	599
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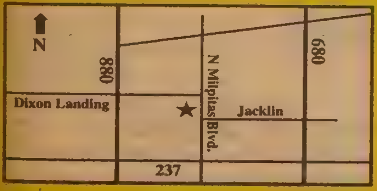

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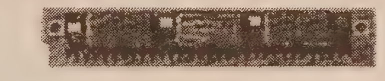

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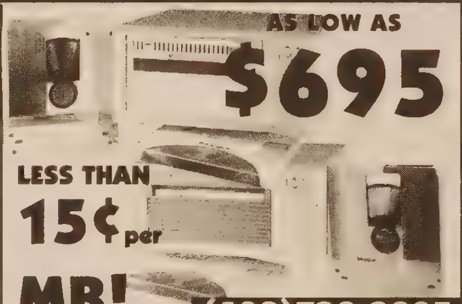

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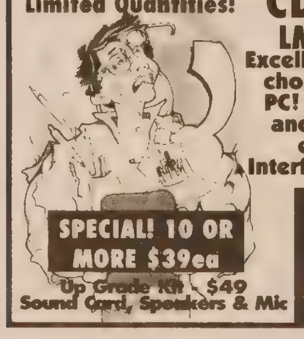

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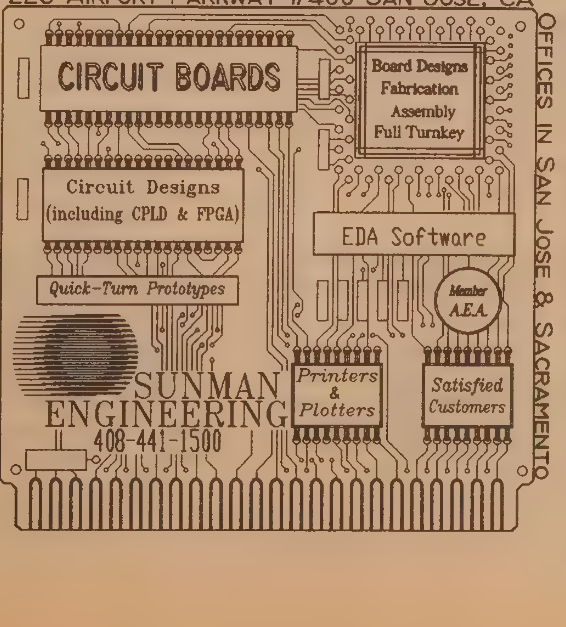

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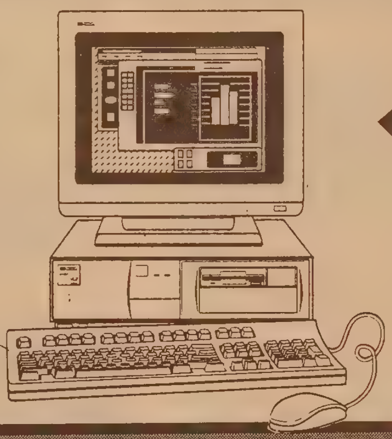

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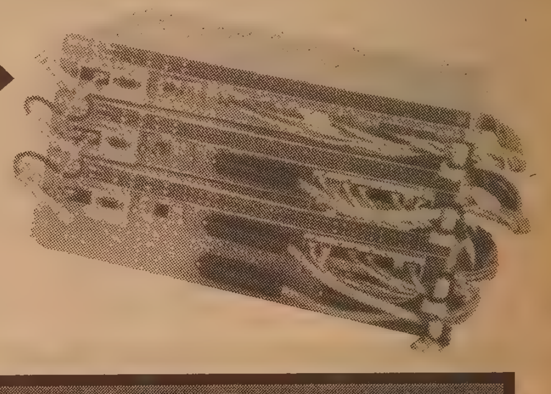

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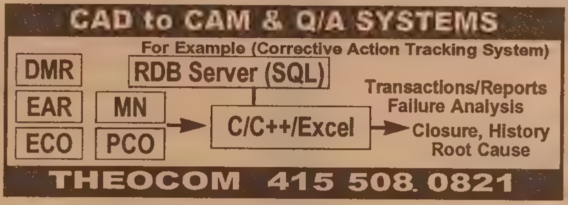

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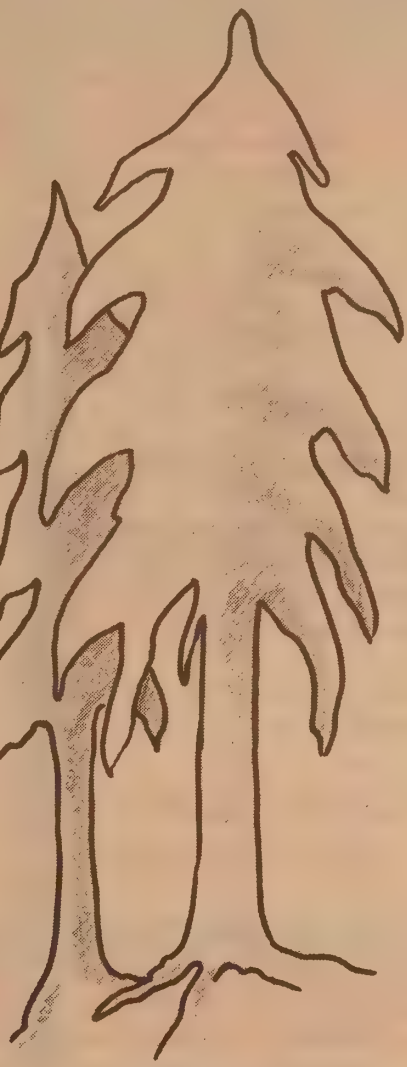

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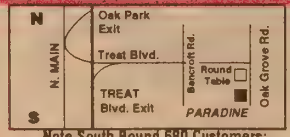

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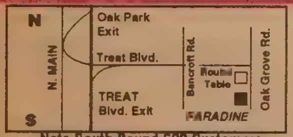

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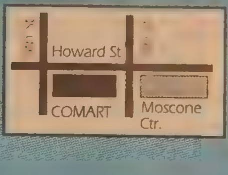

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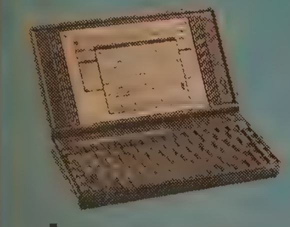

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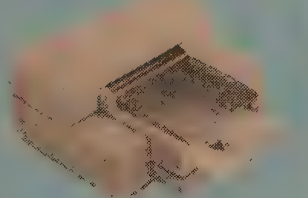

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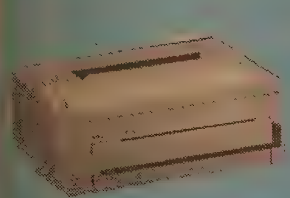

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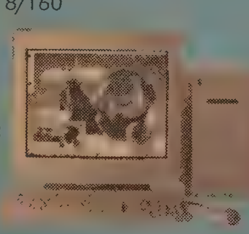

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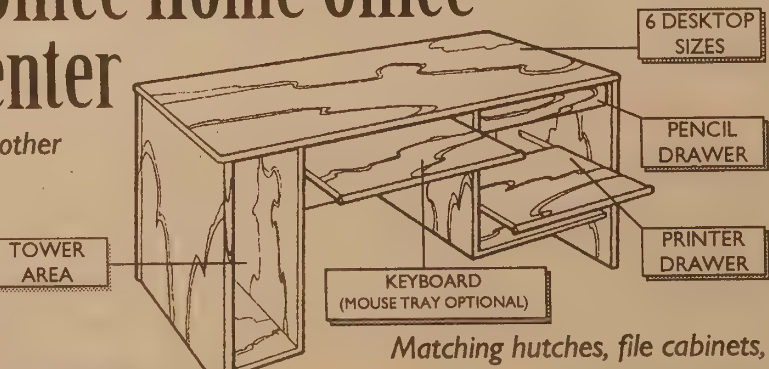

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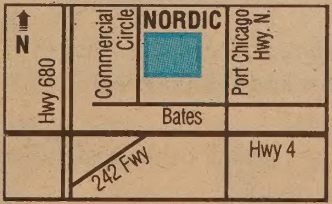

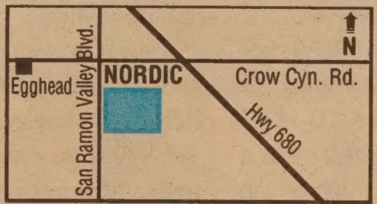

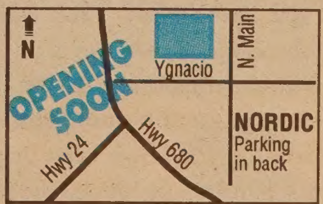

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The Inner Workings Of Venture Capital

Or
Why We're In The Mess We're In!

It was damp on Thursday when I got my appointment with the venture capital firm of Dewey, Cheatham, and Howe. Andy Howe was going to tell me the company's plans for the future and talk about some of the fine investments we can expect to see in the venture capital arena.

Arriving at the firm's Sand Hill Road offices on time for our appointment, I was told to wait, which I did for 2 1/2 hours. I was later informed that I should have taken this as a sign of respect. Most people are kept waiting a minimum of three hours, and in some cases a matter of days.

Archibald Cheatham stood up to explain what it was I was going to see. "As you know, Mr. Dvorak, we are the unassailable experts regarding the direction in which the computer industry goes. We make the trends happen. We're never wrong. And even when we are wrong, it's not our fault. Like with that pen-based nonsense, which was never our idea. That was from those hoserheads at Kleiner Perkins. I told them they were wrong, but would they listen? Nooooo. But we invested anyway, I know and it's a shame that..."

Andy Howe tugged on Cheatham's suit jacket and nodded toward the screen.

"Yes, well, anyway that's water under the bridge. Swine before pigs and all that nonsense. We see things differently today and that's frankly why we make the big bucks. As they say in Hollywood, 'Nothing can stop us now!' If you know what I mean."

The Wave Of The Future

After about ten minutes of this, he finally got to slide number one. He put the pointer on the screen and began. "This is a CD-ROM drive. Do you know what that is? It's not a disk drive, it's the future. The technology will take us into the twenty-first century. The company is CD-Luxe, Inc. The device is a high-speed patented quad head quintuple-speed drive that outperforms many hard disks for access. There is nothing like it."

I thought it seemed like a neat idea.

"More importantly we'll sell it for $100!"

Wow, I thought.

"And it will use our patented proprietary CD-ROM format and CD-Luxe caddy! *That*, my man, is where the profits are: licensing!"

I was taken aback. "I'm sorry. Are you telling me that this device won't play a regular CD-ROM? Just some specially made CD-ROM?"

The whole group gave each other high fives. "He's got it!"

Mark Dewey spoke. "Isn't that a great idea? People will have to license our special CD-ROM technology and the investors will make a ton of money from the never-ending fees. And see how quickly you grasped the concept."

"And the caddy will be another profit center," said Howe pointing one finger into the air as if to make a point.

I sat motionless and said nothing.

Cheatham produced the second slide. The pointer hit the screen. "This is a wireless radio mouse. It requires no receiver. It can actually transmit directly to the pins of the serial port using a newly discovered frequency modulation. It acts just like a regular hard-wired mouse."

Now, this was interesting, if true.

"The company is No-Mouse, and the mouse will sell for $19.95!"

Wow, this sounds great.

"Here's the beauty of it. The transmitter is designed so it can only run off a specially patented and microcircuited battery that costs $50 and lasts about a week. The mouse owners will have to pay about $200 a month to keep the mouse working. Is this genius or what?"

Dewey was nodding and smiling. "Yes, give away the shaver and sell the blades. Pure marketing genius."

The three men gave each other high fives all around once again.

"You guys are on a roll, for sure," I said as I bit my cheek hard.

"Ok," said Cheatham. "The last slide we want to show you. And we do expect to see some significant ink on this stuff. After all, you are very privileged to sit here with us, you know. But first you have to sign this nondisclosure." Cheatham pulled out a piece of paper and put it in front of me.

> **Mark Dewey spoke. "Isn't that a great idea? People will have to license our special CD-ROM technology and the investors will make a ton of money from the never-ending fees."**

"I don't sign these things."

"Oh, OK." He threw it in the can and put the slide up on the screen anyway. The pointer was slapped up there as usual. "This is a piece of string. The company is called String Net. To be frank, this was our idea developed right here in the office. I have a son, about ten, who, it appears, is a genius."

The two partners both nodded as Cheatham continued. "Well, he showed me something phenomenal. He had these two tin cans. He poked a hole in the bottom of each can and ran a string through the hole and knotted it. When the two cans were pulled so the string was tight between them you could talk into one can and be heard from the other can if you put it to your ear. It was a fantastic discovery."

"Unbelievable," said Dewey. "Incredible," said Howe.

I was aghast.

Cheatham was pumped. "So I immediately figured that if sound can be so easily transmitted through the string, why not computer data? You see, Dvorak, this is why we are so good at what we do. We can make that jump in our thinking process. While a kid can invent something simple, it takes an adult to see the big picture. Hence String Net. We really don't want you talking about this for a while. We're in the process of getting a CEO to run this company. Do you think John Sculley would be interested? How about Steve Jobs, is he doing anything?"

"If I see them, I'll ask," I said.

"Good enough!" The three guys high-fived each other. "OK, now we do lunch! We'd love to invite you, Dvorak, but it's a private club. See you later. Betsy will show you out. Glad you're as enthused as we are!"

Betsy showed me to the door and gave me a bag of salted peanuts and closed and locked the door.

I thought the nuts were appropriate. ■

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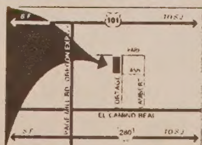

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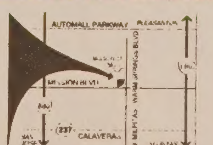

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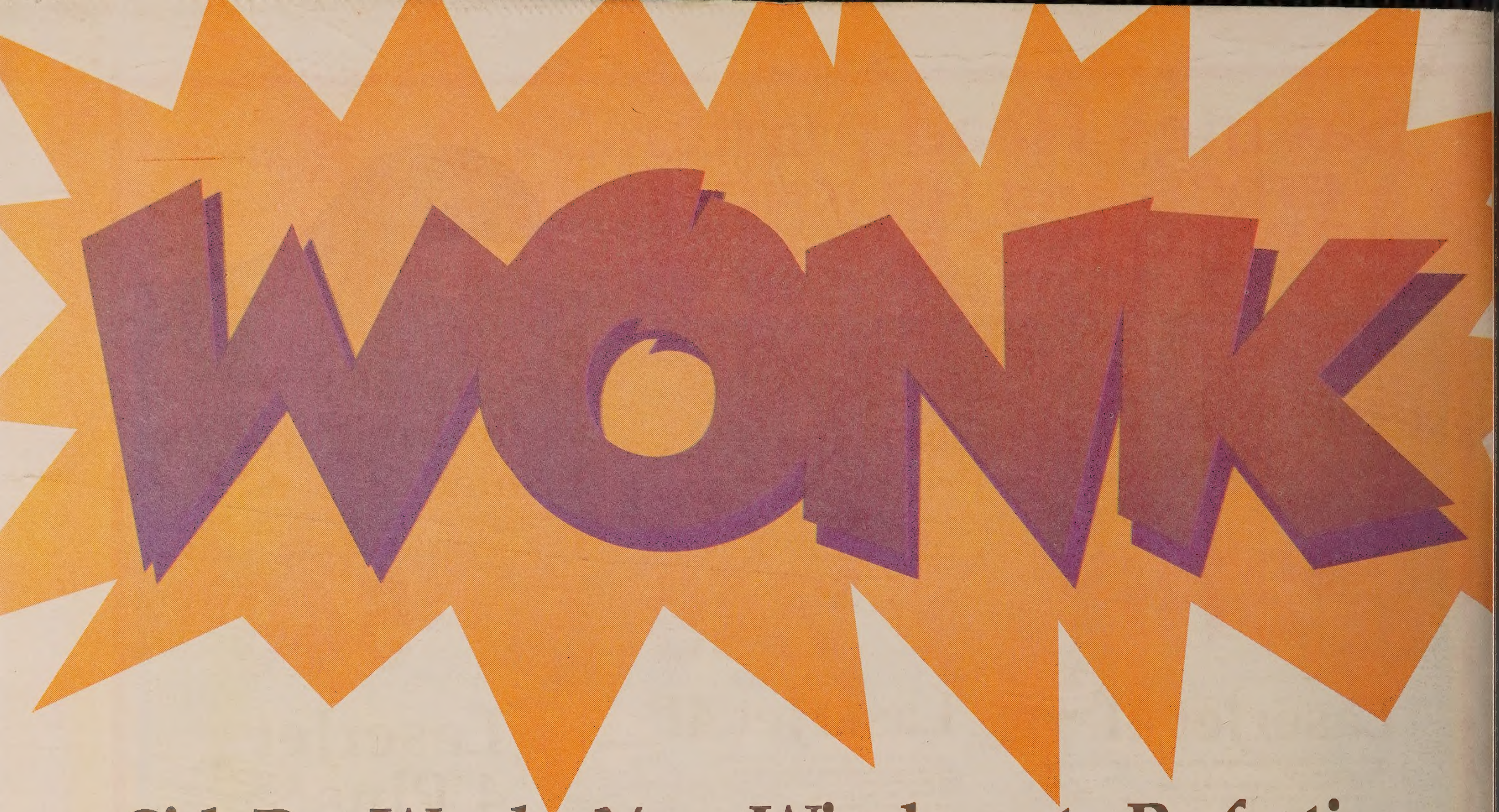

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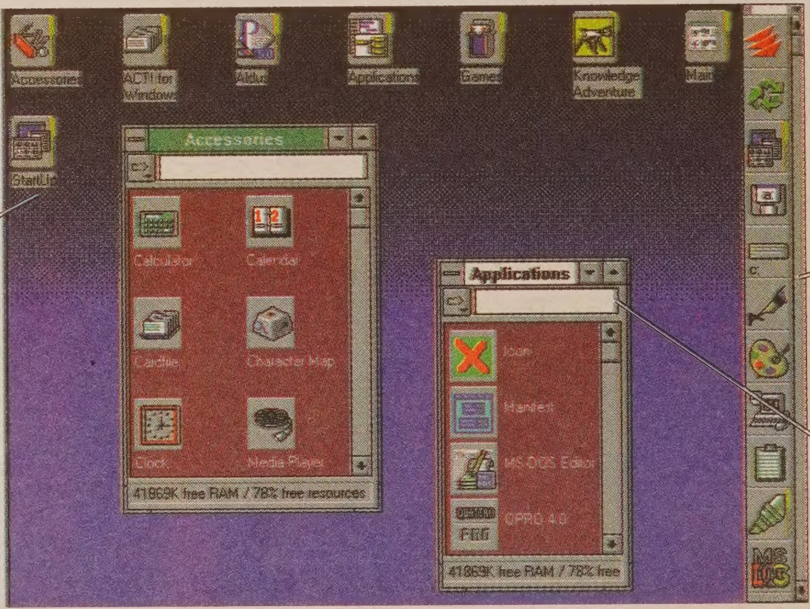
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